APPENDIX 2

ACTIVITY PROFILES FOR GENETIC AND RELATED EFFECTS

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Methods

The x-axis of the activity profile (Waters *et al.*, 1987, 1988) represents the bioassays in phylogenetic sequence by endpoint, and the values on the y-axis represent the logarithmically transformed lowest effective doses (LED) and highest ineffective doses (HID) tested. The term 'dose', as used in this report, does not take into consideration length of treatment or exposure and may therefore be considered synonymous with concentration. In practice, the concentrations used in all the in-vitro tests were converted to μg/ml, and those for in-vivo tests were expressed as mg/kg bw. Because dose units are plotted on a log scale, differences in molecular weights of compounds do not, in most cases, greatly influence comparisons of their activity profiles. Conventions for dose conversions are given below.

Profile-line height (the magnitude of each bar) is a function of the LED or HID, which is associated with the characteristics of each individual test system – such as population size, cell-cycle kinetics and metabolic competence. Thus, the detection limit of each test system is different, and, across a given activity profile, responses will vary substantially. No attempt is made to adjust or relate responses in one test system to those of another.

Line heights are derived as follows: for negative test results, the highest dose tested without appreciable toxicity is defined as the HID. If there was evidence of extreme toxicity, the next highest dose is used. A single dose tested with a negative result is considered to be equivalent to the HID. Similarly, for positive results, the LED is recorded. If the original data were analysed statistically by the author, the dose recorded is that at which the response was significant ($p < 0.05$). If the available data were not analysed statistically, the dose required to produce an effect is estimated as follows: when a dose-related positive response is observed with two or more doses, the lower of the doses is taken as the LED; a single dose resulting in a positive response is considered to be equivalent to the LED.

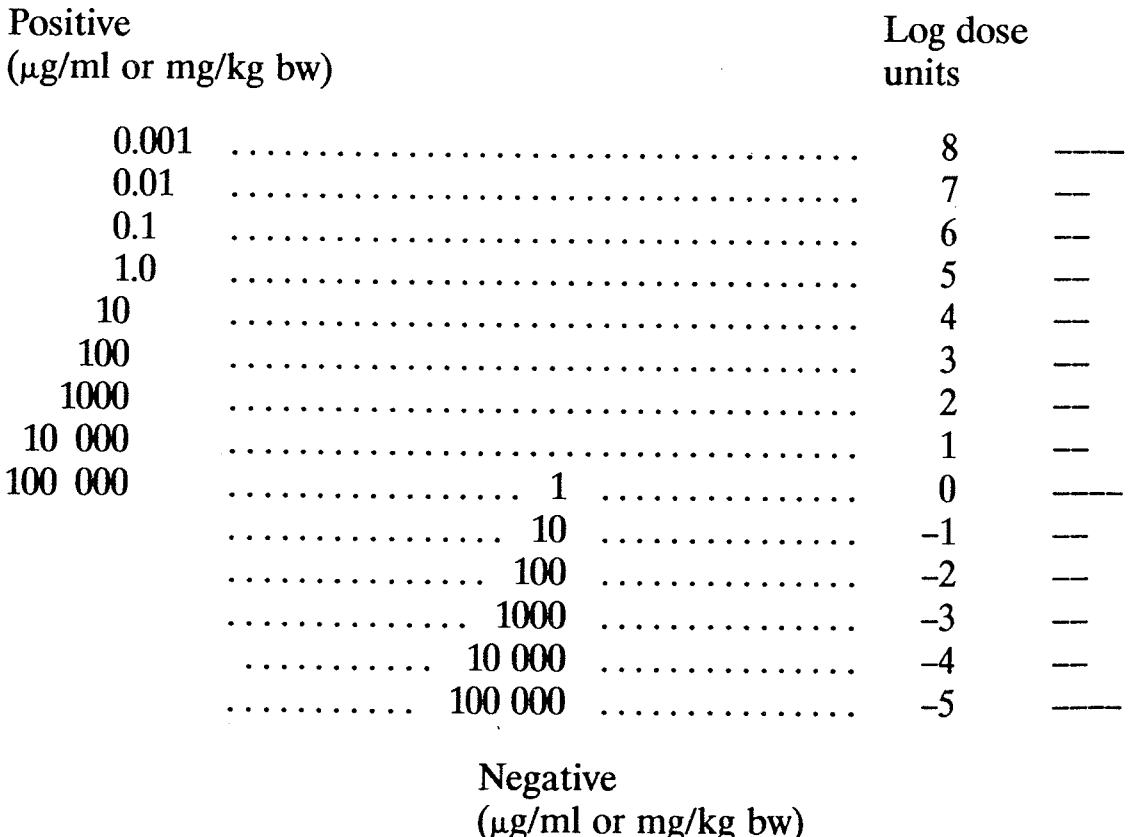
In order to accommodate both the wide range of doses encountered and positive and negative responses on a continuous scale, doses are transformed logarith-

mically, so that effective (LED) and ineffective (HID) doses are represented by positive and negative numbers, respectively. The response, or logarithmic dose unit (LDU_{ij}), for a given test system i and chemical j *is* represented by the expressions

$$LDU_{ij} = -\log_{10}(\text{dose}), \text{ for HID values; LDU} \leq 0$$
$$\text{and} \qquad (1)$$
$$LDU_{ij} = -\log_{10}(\text{dose} \times 10^{-5}), \text{ for LED values; LDU} \geq 0.$$

These simple relationships define a dose range of 0 to -5 logarithmic units for ineffective doses (1–100 000 μg/ml or mg/kg bw) and 0 to +8 logarithmic units for effective doses (100 000–0.001 μg/ml or mg/kg bw). A scale illustrating the LDU values is shown in Figure 1. Negative responses at doses less than 1 μg/ml (mg/kg bw) are set equal to 1. Effectively, an LED value ≥100 000 or an HID value ≤1 produces an LDU = 0; no quantitative information is gained from such extreme values. The dotted lines at the levels of log dose units 1 and -1 define a 'zone of uncertainty' in which positive results are reported at such high doses (between 10 000 and 100 000 μg/ml or mg/kg bw) or negative results are reported at such low dose levels (1 to 10 μg/ml or mg/kg bw) as to call into question the adequacy of the test.

Fig. 1. Scale of log dose units used on the y-axis of activity profiles



LED and HID are expressed as μg/ml or mg/kg bw.

In practice, an activity profile is computer generated. A data entry programme is used to store abstracted data from published reports. A sequential file (in ASCII) is created for each compound, and a record within that file consists of the name and Chemical Abstracts Service number of the compound, a three-letter code for the test system (see below), the qualitative test result (with and without an exogenous metabolic system), dose (LED or HID), citation number and additional source information. An abbreviated citation for each publication is stored in a segment of a record accessing both the test data file and the citation file. During processing of the data file, an average of the logarithmic values of the data subset is calculated, and the length of the profile line represents this average value. All dose values are plotted for each profile line, regardless of whether results are positive or negative. Results obtained in the absence of an exogenous metabolic system are indicated by a bar (–), and results obtained in the presence of an exogenous metabolic system are indicated by an upward-directed arrow (↑). When all results for a given assay are either positive or negative, the mean of the LDU values is plotted as a solid line; when conflicting data are reported for the same assay (i.e., both positive and negative results), the majority data are shown by a solid line and the minority data by a dashed line (drawn to the extreme conflicting response). In the few cases in which the numbers of positive and negative results are equal, the solid line is drawn in the positive direction and the maximal negative response is indicated with a dashed line.

Profile lines are identified by three-letter code words representing the commonly used tests. Code words for most of the test systems in current use in genetic toxicology were defined for the US Environmental Protection Agency's GENE-TOX Program (Waters, 1979; Waters & Auletta, 1981). For IARC Monographs Supplement 6, Volume 44 and subsequent volumes, including this publication, codes were redefined in a manner that should facilitate inclusion of additional tests. If a test system is not defined precisely, a general code is used that best defines the category of the test. Naming conventions are described below.

Data listings are presented with each activity profile and include endpoint and test codes, a short test code definition, results [either with (M) or without (NM) an exogenous activation system], the associated LED or HID value and a short citation. Test codes are organized phylogenetically and by endpoint from left to right across each activity profile and from top to bottom of the corresponding data listing. Endpoints are defined as follows: A, aneuploidy; C, chromosomal aberrations; D, DNA damage; F, assays of body fluids; G, gene mutation; H, host-mediated assays; I, inhibition of intercellular communication; M, micronuclei; P, sperm morphology; R, mitotic recombination or gene conversion; S, sister chromatid exchange; and T, cell transformation.

Dose conversions for activity profiles

Doses are converted to μg/ml for in-vitro tests and to mg/kg bw per day for in-vivo experiments.

1. In-vitro test systems

   (a) Weight/volume converts directly to μg/ml.

   (b) Molar (M) concentration x molecular weight = mg/ml = 10^3 μg/ml; mM concentration x molecular weight = μg/ml.

   (c) Soluble solids expressed as % concentration are assumed to be in units of mass per volume (i.e., 1% = 0.01 g/ml = 10 000 μg/ml; also, 1 ppm = 1 μg/ml).

   (d) Liquids and gases expressed as % concentration are assumed to be given in units of volume per volume. Liquids are converted to weight per volume using the density (D) of the solution (D = g/ml). Gases are converted from volume to mass using the ideal gas law, PV = nRT. For exposure at 20–37°C at standard atmospheric pressure, 1% (v/v) = 0.4 μg/ml x molecular weight of the gas. Also, 1 ppm (v/v) = 4×10^{-5} μg/ml x molecular weight.

   (e) In microbial plate tests, it is usual for the doses to be reported as weight/plate, whereas concentrations are required to enter data on the activity profile chart. While remaining cognisant of the errors involved in the process, it is assumed that a 2-ml volume of top agar is delivered to each plate and that the test substance remains in solution within it; concentrations are derived from the reported weight/plate values by dividing by this arbitrary volume. For spot tests, a 1-ml volume is used in the calculation.

   (f) Conversion of particulate concentrations given in μg/cm^2 are based on the area (A) of the dish and the volume of medium per dish; i.e., for a 100-mm dish: $A = \pi R^2 = \pi \times (5\ \text{cm})^2 = 78.5\ \text{cm}^2$. If the volume of medium is 10 ml, then 78.5 cm^2 = 10 ml and 1 cm^2 = 0.13 ml.

2. In-vitro systems using in-vivo activation

   For the body fluid–urine (BF–) test, the concentration used is the dose (in mg/kg bw) of the compound administered to test animals or patients.

3. In-vivo test systems

   (a) Doses are converted to mg/kg bw per day of exposure, assuming 100% absorption. Standard values are used for each sex and species of rodent, including body weight and average intake per day, as reported by Gold *et al.* (1984). For example, in a test using male mice fed 50 ppm of the agent

in the diet, the standard food intake per day is 12% of body weight, and the conversion is dose = 50 ppm × 12% = 6 mg/kg bw per day.

Standard values used for humans are: weight - males, 70 kg; females, 55 kg; surface area, 1.7 m^2; inhalation rate, 20 l/min for light work, 30 l/min for mild exercise.

(b) When reported, the dose at the target site is used. For example, doses given in studies of lymphocytes of humans exposed *in vivo* are the measured blood concentrations in μg/ml.

Codes for test systems

For specific nonmammalian test systems, the first two letters of the three-symbol code word define the test organism (e.g., SA- for *Salmonella typhimurium*, EC- for *Escherichia coli).* If the species is not known, the convention used is -S-. The third symbol may be used to define the tester strain (e.g., SA8 for *S. typhimurium* TA1538, ECW for *E. coli* WP2*uvrA*). When strain designation is not indicated, the third letter is used to define the specific genetic endpoint under investigation (e.g., —D for differential toxicity, —F for forward mutation, —G for gene conversion or genetic crossing-over, —N for aneuploidy, —R for reverse mutation, —U for unscheduled DNA synthesis). The third letter may also be used to define the general endpoint under investigation when a more complete definition is not possible or relevant (e.g., —M for mutation, —C for chromosomal aberration).

For mammalian test systems, the first letter of the three-letter code word defines the genetic endpoint under investigation: A— for aneuploidy, B— for binding, C— for chromosomal aberration, D— for DNA strand breaks, G— for gene mutation, I— for inhibition of intercellular communication, M— for micronucleus formation, R— for DNA repair, S— for sister chromatid exchange, T— for cell transformation and U— for unscheduled DNA synthesis.

For animal (i.e., non-human) test systems *in vitro*, when the cell type is not specified, the code letters -IA are used. For such assays *in vivo*, when the animal species is not specified, the code letters -VA are used. Commonly used animal species are identified by the third letter (e.g., —C for Chinese hamster, —M for mouse, —R for rat, —S for Syrian hamster).

For test systems using human cells *in vitro*, when the cell type is not specified, the code letters -IH are used. For assays on humans *in vivo*, when the cell type is not specified, the code letters -VH are used. Otherwise, the second letter specifies the cell type under investigation (e.g., -BH for bone marrow, -LH for lymphocytes).

Some other specific coding conventions used for mammalian systems are as follows: BF- for body fluids, HM- for host-mediated, —L for leucocytes or lymphocytes *in vitro* (-AL, animals; -HL, humans), -L- for leucocytes *in vivo* (-LA, animals; -LH, humans), —T for transformed cells.

Note that these are examples of major conventions used to define the assay code words. The alphabetized listing of codes must be examined to confirm a specific code word. As might be expected from the limitation to three symbols, some codes do not fit the naming conventions precisely. In a few cases, test systems are defined by first-letter code words, for example: MST, mouse spot test; SLP, mouse specific locus test, postspermatogonia; SLO, mouse specific locus test, other stages; DLM, dominant lethal test in mice; DLR, dominant lethal test in rats; MHT, mouse heritable translocation test.

The genetic activity profiles and listings that follow were prepared in collaboration with Environmental Health Research and Testing Inc. (EHRT) under contract to the US Environmental Protection Agency; EHRT also determined the doses used. The references cited in each genetic activity profile listing can be found in the list of references in the appropriate monograph.

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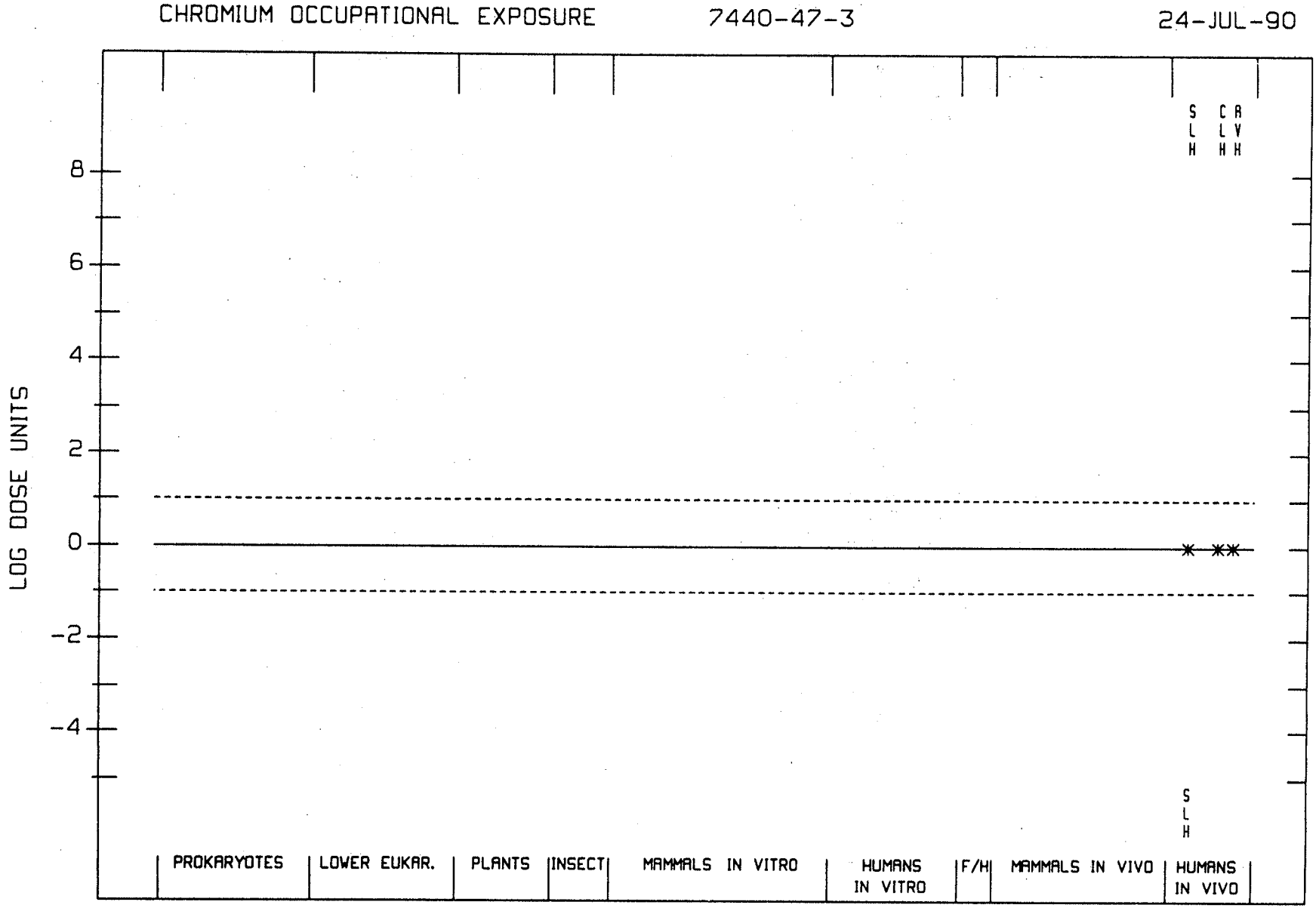
CHROMIUM OCCUPATIONAL EXPOSURE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE (LED OR HID)	REFERENCE
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	+	0	0.0000	STELLA ET AL., 1982
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	+	0	0.0000	SARTO ET AL., 1982
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	-	0	0.0000	NAGAYA, 1986
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	-	0	0.0000	NAGAYA ET AL., 1989
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	+	0	0.0000	CHOI ET AL., 1987
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	(+)	0	0.0000	DENG ET AL., 1983
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	+	0	0.0000	SARTO ET AL., 1982
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	+	0	0.0000	DENG ET AL., 1983
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	+	0	0.0000	BIGALIEV ET AL., 1977b
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO[1]	?	0	0.0000	HAMAMY ET AL., 1987
A	AVH	ANEUPLOIDY, HUMAN CELLS IN VIVO	+	0	0.0000	BIGALIEV ET AL., 1977b

[1]Exposure to Cr(III); all other references are to Cr(VI) exposures.


CHROMIUM OCCUPATIONAL EXPOSURE
7440-47-3
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
S L H
C L H
A V H
S L H
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

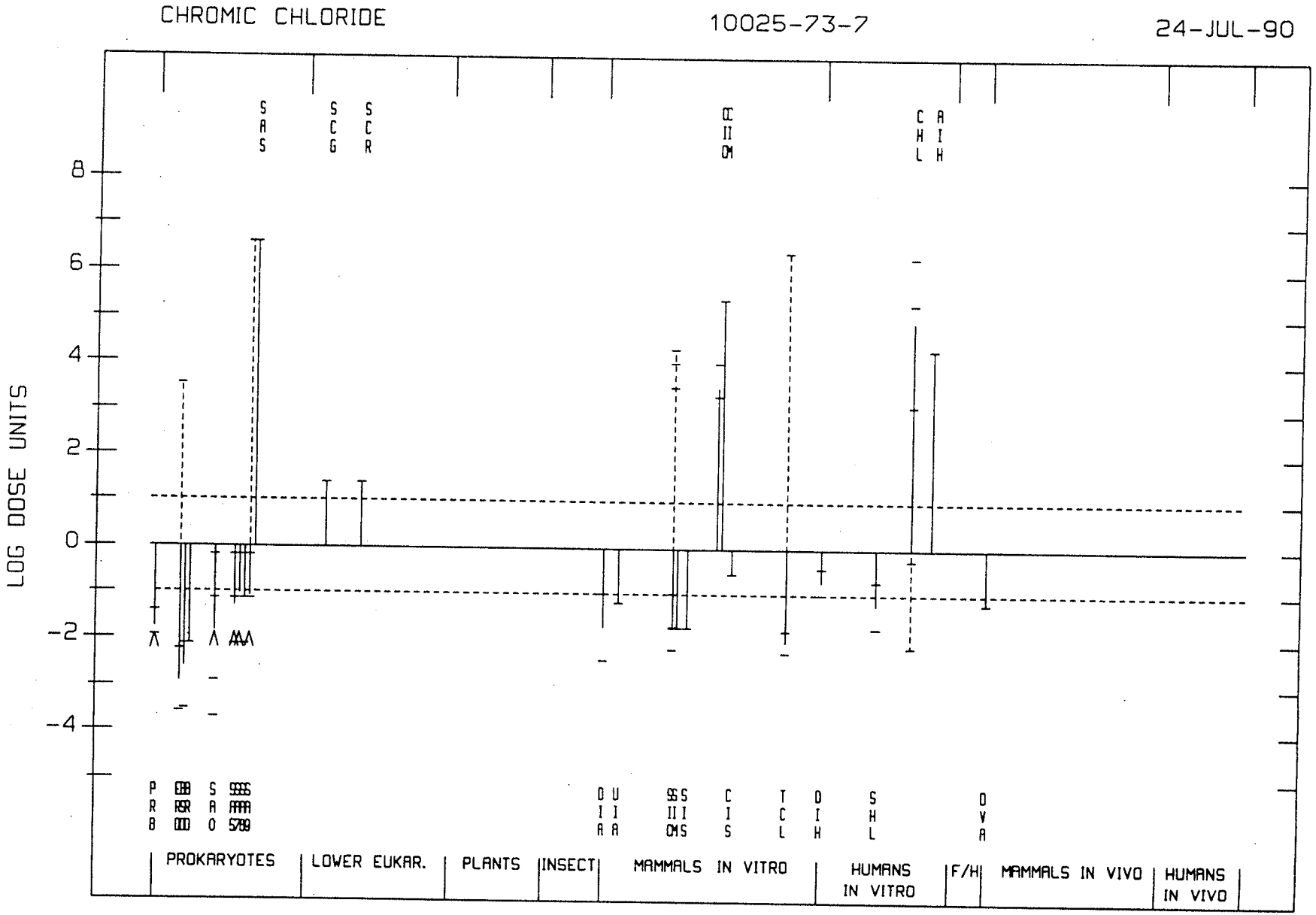
END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	0	87.0000	LLAGOSTERA ET AL., 1986
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	0	26.0000	ROSSMAN ET AL., 1984
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	0	0.0520	OLIVIER & MARZIN, 1987
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	-	85.0000	VENIER ET AL., 1989
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	-	0	170.0000	WARREN ET AL., 1981
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	-	30.0000	DE FLORA ET AL., 1984a
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	-	0	3900.0000	YAGI & NISHIOKA, 1977
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	130.0000	NISHIOKA, 1975
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	3380.0000	NAKAMURO ET AL., 1978
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	130.0000	GENTILE ET AL., 1981
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	0.0000	MATSUI, 1980
D	BRD	BACTERIA (OTHER), DIFFERENTIAL TOXICITY	-	0	130.0000	GENTILE ET AL., 1981
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	785.0000	PETRILLI & DE FLORA, 1978a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	78.0000	PETRILLI & DE FLORA, 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	1.5000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	5200.0000	TSO & FUNG, 1981
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	14.0000	VENIER ET AL., 1982
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	14.0000	BIANCHI ET AL., 1983
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984b
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	0	0.0500	MARZIN & PHI, 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	78.0000	PETRILLI & DE FLORA, 1977
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	1.5000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	14.0000	BIANCHI ET AL., 1983
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	14.0000	VENIER ET AL., 1982
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	130.0000	TAMARO ET AL., 1975
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	78.0000	PETRILLI & DE FLORA, 1977
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	1.5000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	1.5000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	14.0000	BIANCHI ET AL., 1983
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	14.0000	VENIER ET AL., 1982
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	130.0000	TAMARO ET AL., 1975
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	78.0000	PETRILLI & DE FLORA, 1977
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	1.5000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	14.0000	VENIER ET AL., 1982
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	14.0000	BIANCHI ET AL., 1983

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	0	0.0260	LANGERWERF ET AL., 1985
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984b
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	0:0260	LANGERWERF ET AL., 1985
G	ECF	E. COLI (EXCLUDING K12), FORWARD MUTATION	?	0	0.0000	ZAKOUR & GLICKMAN, 1984
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	-	0	0.0000	PETRILLI & DE FLORA, 1982
G	EC2	E. COLI WP2, REVERSE MUTATION	-	0	0.0000	PETRILLI & DE FLORA, 1982
R	SCG	S. CEREVISIAE, GENE CONVERSION	+	+	4160.0000	GALLI ET AL., 1985
G	SCR	S. CEREVISIAE, REVERSE MUTATION	+	(+)	4160.0000	GALLI ET AL., 1985
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	-	0	10.0000	FORNACE ET AL., 1981
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	-	0	260.0000	BIANCHI ET AL., 1983
D	UIA	UDS, OTHER ANIMAL CELLS IN VITRO	-	0	16.0000	RAFFETTO ET AL., 1977
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	50.0000	MAJONE & RENSI, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	0.4000	MACRAE ET AL., 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	50.0000	LEVIS & MAJONE, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	32.0000	OHNO ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	1.0000	KOSHI, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	50.0000	VENIER ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	9.8000	ELIAS ET AL., 1983
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	9.8000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	0.5200	UYEKI & NISHIO, 1983
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	52.0000	BIANCHI ET AL., 1983
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	BIANCHI ET AL., 1980
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	5.0000	VENIER ET AL., 1985a
S	SIM	SCE, MOUSE CELLS IN VITRO	-	0	52.0000	MAJONE ET AL., 1983
S	SIM	SCE, MOUSE CELLS IN VITRO	-	0	52.0000	BIANCHI ET AL., 1983
S	SIS	SCE, SYRIAN HAMSTER CELLS IN VITRO	-	0	52.0000	BIANCHI ET AL., 1984
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	50.0000	MAJONE & RENSI, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	(+)	0	50.0000	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	10.0000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	50.0000	VENIER ET AL., 1982
C	CIM	CHROM ABERR, MOUSE CELLS IN VITRO	+	0	0.4000	RAFFETTO ET AL., 1977
C	CIS	CHROM ABERR, SYRIAN HAMSTER CELLS IN VITRO	-	0	3.5000	TSUDA & KATO, 1977
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	-	0	0.6000	RIVEDAL & SANNER, 1981

CHROMIC CHLORIDE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	0.0400	RAFFETTO ET AL., 1977
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	-	0	60.0000	BIANCHI ET AL., 1983
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	-	0	175.0000	HANSEN & STERN, 1985
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	-	0	2.6000	MCLEAN ET AL., 1982
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	-	0	10.0000	FORNACE ET AL., 1981
D	UHF	UDS, HUMAN FIBROBLASTS IN VITRO	-	0	0.0000	BIANCHI ET AL., 1983
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	-	0	5.2000	OGAWA ET AL., 1978
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	-	0	52.0000	STELLA ET AL., 1982
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	-	0	130.0000	SARTO ET AL., 1980
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	0.0520	STELLA ET AL., 1982
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	-	0	1.7000	NAKAMURO ET AL., 1978
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	0.5000	FRIEDMAN ET AL., 1987
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	78.5000	KANEKO, 1976
A	AIH	ANEUPLOIDY, HUMAN CELLS IN VITRO	+	0	5.0000	NIJS & KIRSCH-VOLDERS, 1986
D	DVA	STRAND BREAKS/X-LINKS, ANIMALS IN VIVO	-	0	16.0000	TSAPAKOS ET AL., 1983b
D	DVA	STRAND BREAKS/X-LINKS, ANIMALS IN VIVO	-	0	16.0000	CUPO & WETTERHAHN, 1985

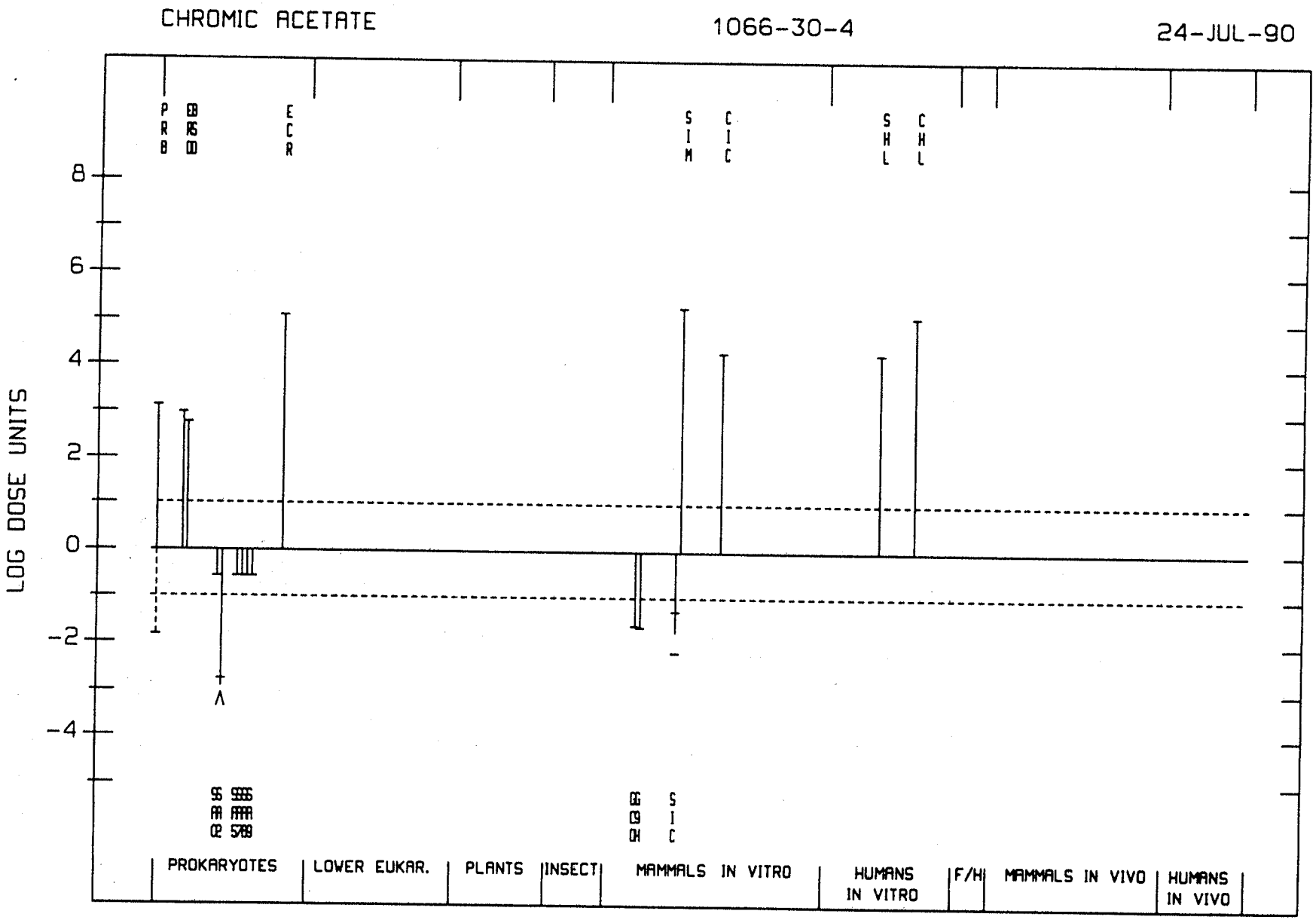
[1]Doses are given as concentrations of the element, not the concentration of the compound.


CHROMIC CHLORIDE
10025-73-7
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
SAS
SCG
SCR
CHL
AIH
PRB
SAO
DIA
UIA
SIS
CIS
TCL
DIH
SHL
DVA
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMIC ACETATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	0	70.0000	LLAGOSTERA ET AL., 1986
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	-	75.0000	VENIER ET AL., 1989
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	+	105:0000	DE FLORA ET AL., 1984a
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	170.0000	NAKAMURO ET AL., 1978
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	3.6000	DE FLORA, 1981a
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	-	1135.0000	BENNICELLI ET AL., 1983
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	0	570.0000	PETRILLI ET AL., 1985
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984b
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	3.6000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	3.6000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	3.6000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	3.6000	DE FLORA, 1981a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984b
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	-	0	0.0000	PETRILLI & DE FLORA, 1982
G	EC2	E. COLI WP2, REVERSE MUTATION	-	0	0.0000	PETRILLI & DE FLORA, 1982
G	ECR	E. COLI (OTHER), REVERSE MUTATION	+	0	0.8000	NAKAMURO ET AL., 1978
G	GCO	MUTATION, CHO CELLS IN VITRO	-	0	42.0000	BIANCHI ET AL., 1983
G	G9H	MUTATION, CHL V79 CELLS, HPRT	-	0	45.0000	NEWBOLD ET AL., 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	20.0000	LEVIS & MAJONE, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	BIANCHI ET AL., 1980
S	SIM	SCE, MOUSE CELLS IN VITRO	+	0	0.5200	ANDERSEN, 1983
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	5.0000	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	5.2000	ANDERSEN, 1983
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	0.8000	NAKAMURO ET AL., 1978

[1]Doses are given as concentrations of the element, not the concentration of the compound.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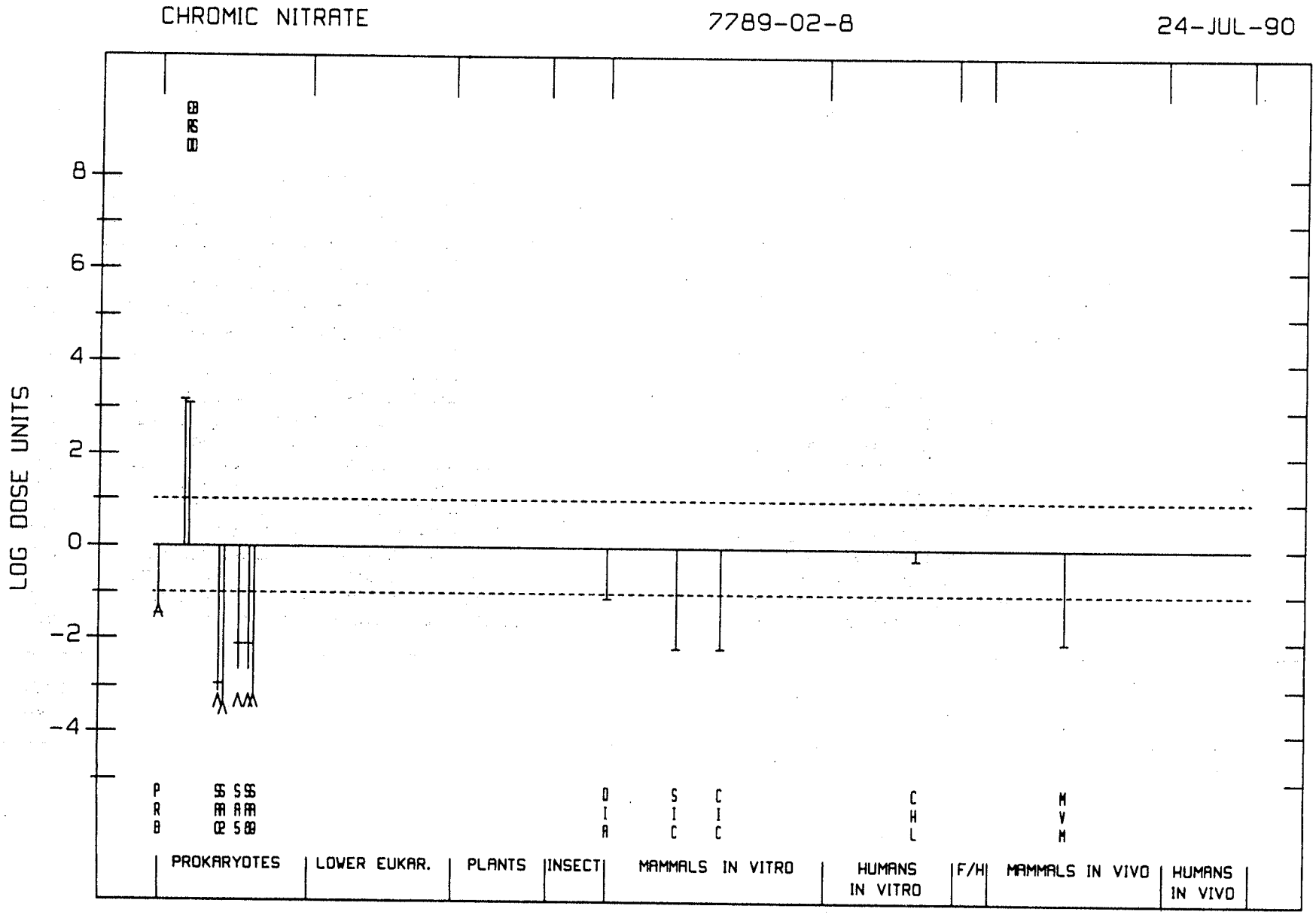
1066-30-4
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMIC NITRATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	0	30.0000	LLAGOSTERA ET AL., 1986
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	-	19.0000	VENIER ET AL., 1989
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	-	68.0000	DE FLORA ET AL., 1984a
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	83:0000	NAKAMURO ET AL., 1978
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	875.0000	PETRILLI & DE FLORA, 1978a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	1.0000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	1500.0000	VENIER ET AL., 1982
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	1530.0000	BIANCHI ET AL., 1983
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	-	2185.0000	BENNICELLI ET AL., 1983
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984b
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	1.0000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	1500.0000	VENIER ET AL., 1982
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	130.0000	TAMARO ET AL., 1975
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	1.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	1.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	1500.0000	VENIER ET AL., 1982
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	130.0000	TAMARO ET AL., 1975
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	1.0000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	1500.0000	VENIER ET AL., 1982
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984b
C	VFC	VICIA FABA, CHROM ABERR	+	0	0.0000	GLASS, 1955
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	-	0	13.0000	TSAPAKOS ET AL., 1983a
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	LEVIS & MAJONE, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	BIANCHI ET AL., 1980
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	VENIER ET AL., 1982
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	BIANCHI ET AL., 1980
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	VENIER ET AL., 1982
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	-	0	1.7000	NAKAMURO ET AL., 1978
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	-	0	110.0000	FABRY, 1980

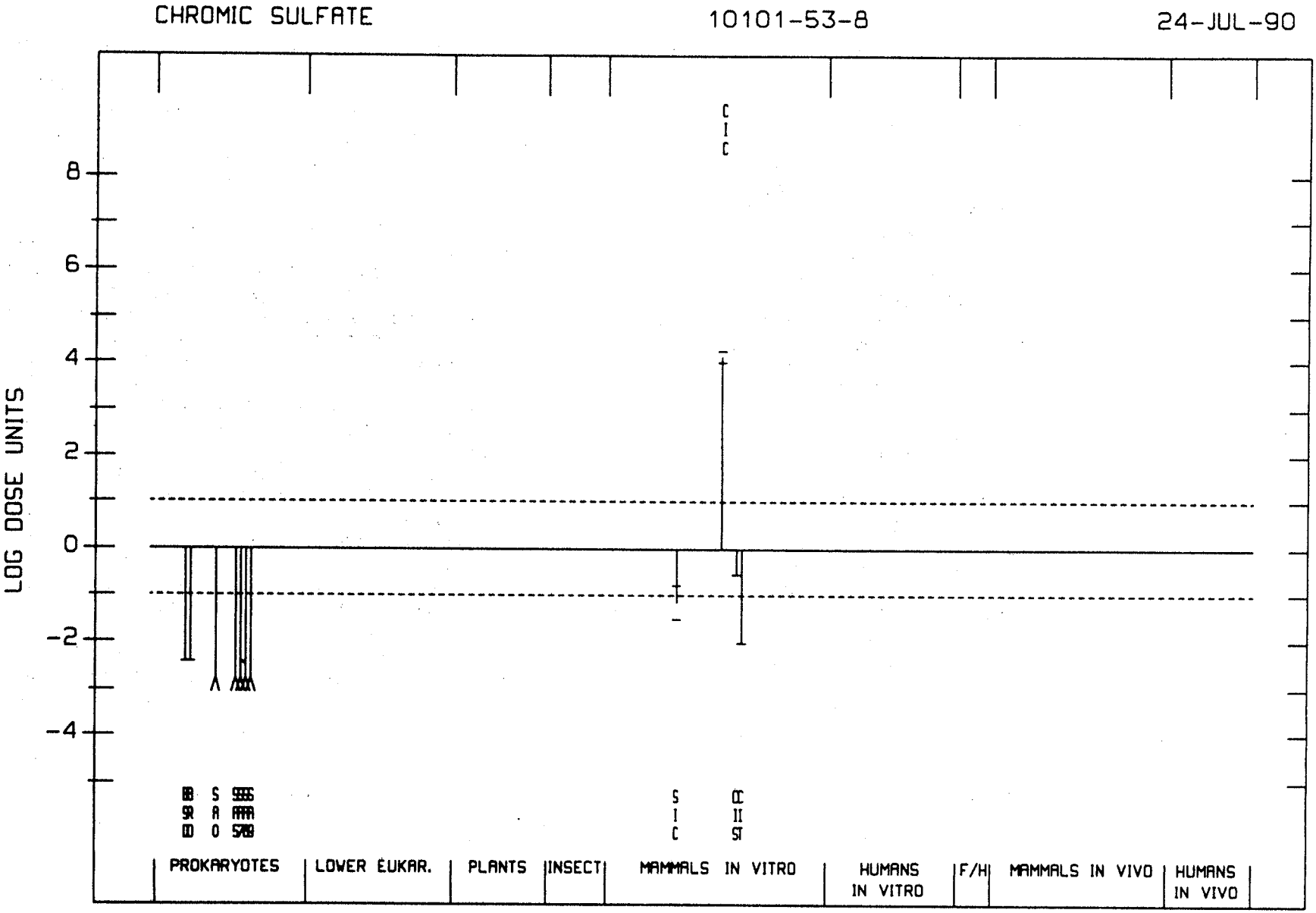
[1]Doses are given as concentrations of the element, not the concentration of the compound.


CHROMIC NITRATE
7789-02-8
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMIC SULFATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	260.0000	GENTILE ET AL., 1981
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	0.0000	KADA ET AL., 1980
D	BRD	BACTERIA (OTHER), DIFFERENTIAL TOXICITY	-	0	260.0000	GENTILE ET AL., 1981
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	0:0000	ARLAUSKAS ET AL., 1985
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	560.0000	LOPRIENO ET AL., 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	560.0000	LOPRIENO ET AL., 1985
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	560.0000	LOPRIENO ET AL., 1985
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	560.0000	LOPRIENO ET AL., 1985
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	560.0000	LOPRIENO ET AL., 1985
G	ECR	E. COLI (OTHER), REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	6.0000	OHNO ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	34.0000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	0.2200	LOPRIENO ET AL., 1985
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	5.6000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	10.0000	ROSSNER ET AL., 1981
C	CIS	CHROM ABERR, SYRIAN HAMSTER CELLS IN VITRO	-	0	3.5000	TSUDA & KATO, 1977
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	-	0	104.0000	UMEDA & NISHIMURA, 1979

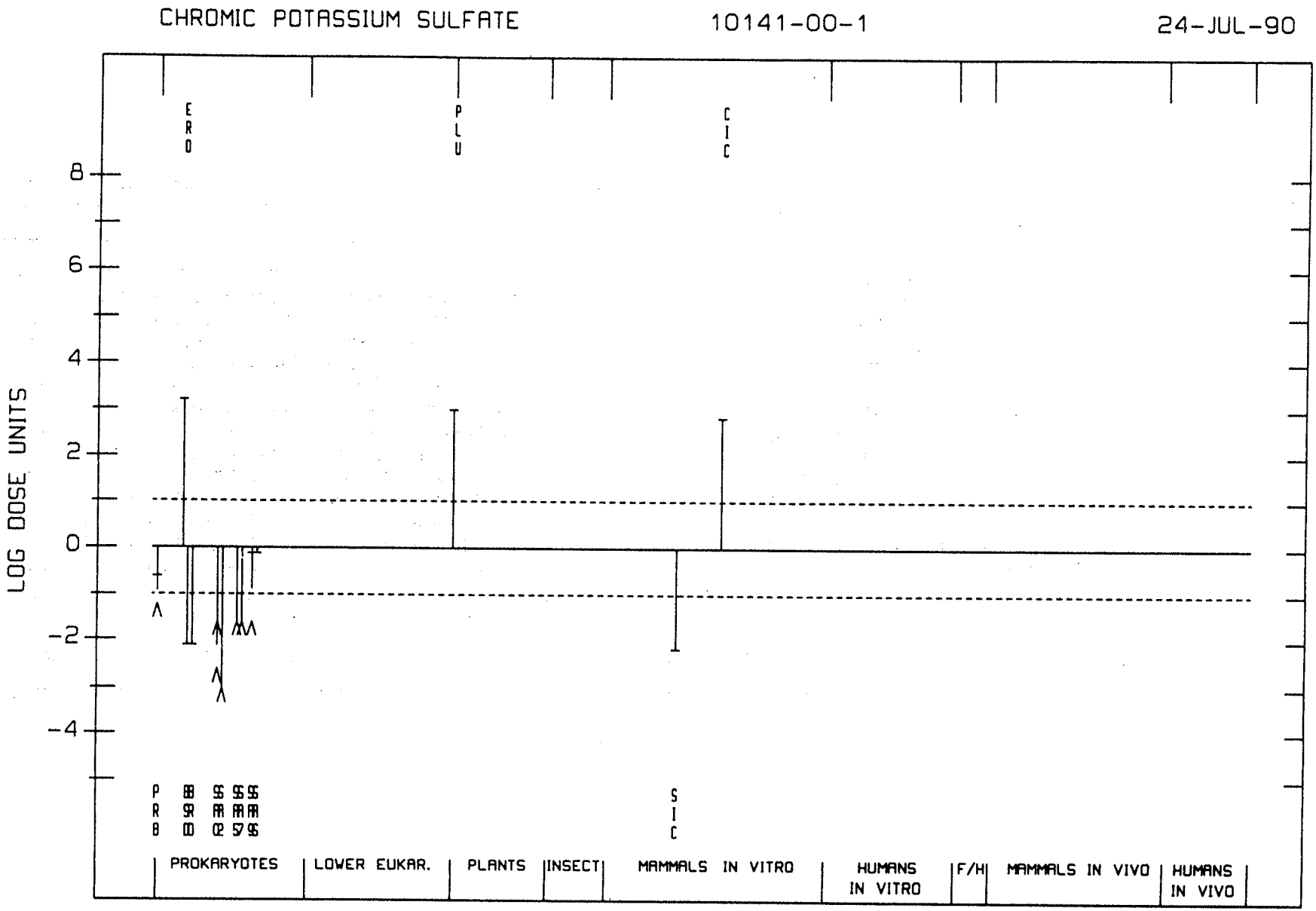
[1]Doses are given as concentrations of the element, not the concentration of the compound.


CHROMIC SULFATE
10101-53-8
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
C
I
C
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMIC POTASSIUM SULFATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	0	4.0000	DE FLORA ET AL., 1985a
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	-	17.0000	VENIER ET AL., 1989
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	-	65.0000	DE FLORA ET AL., 1984a
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	130:0000	GENTILE ET AL., 1981
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	0.0000	KADA ET AL., 1980
D	BRD	BACTERIA (OTHER), DIFFERENTIAL TOXICITY	-	0	130.0000	GENTILE ET AL., 1981
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	400.0000	PETRILLI & DE FLORA, 1978a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	42.0000	PETRILLI & DE FLORA, 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	0.8000	DE FLORA, 1981a
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	-	1042.0000	BENNICELLI ET AL., 1983
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984b
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	42.0000	PETRILLI & DE FLORA, 1977
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.8000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	42.0000	PETRILLI & DE FLORA, 1977
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	0.8000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	0.8000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	42.0000	PETRILLI & DE FLORA, 1977
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	0.8000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	1.3000	LANGERWERF ET AL., 1985
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	1.3000	LANGERWERF ET AL., 1985
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984b
D	PLU	PLANTS, UDS	+	0	104.0000	JACKSON & LINSKENS, 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	LEVIS & MAJONE, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	150.0000	BIANCHI ET AL., 1980
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	150.0000	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980

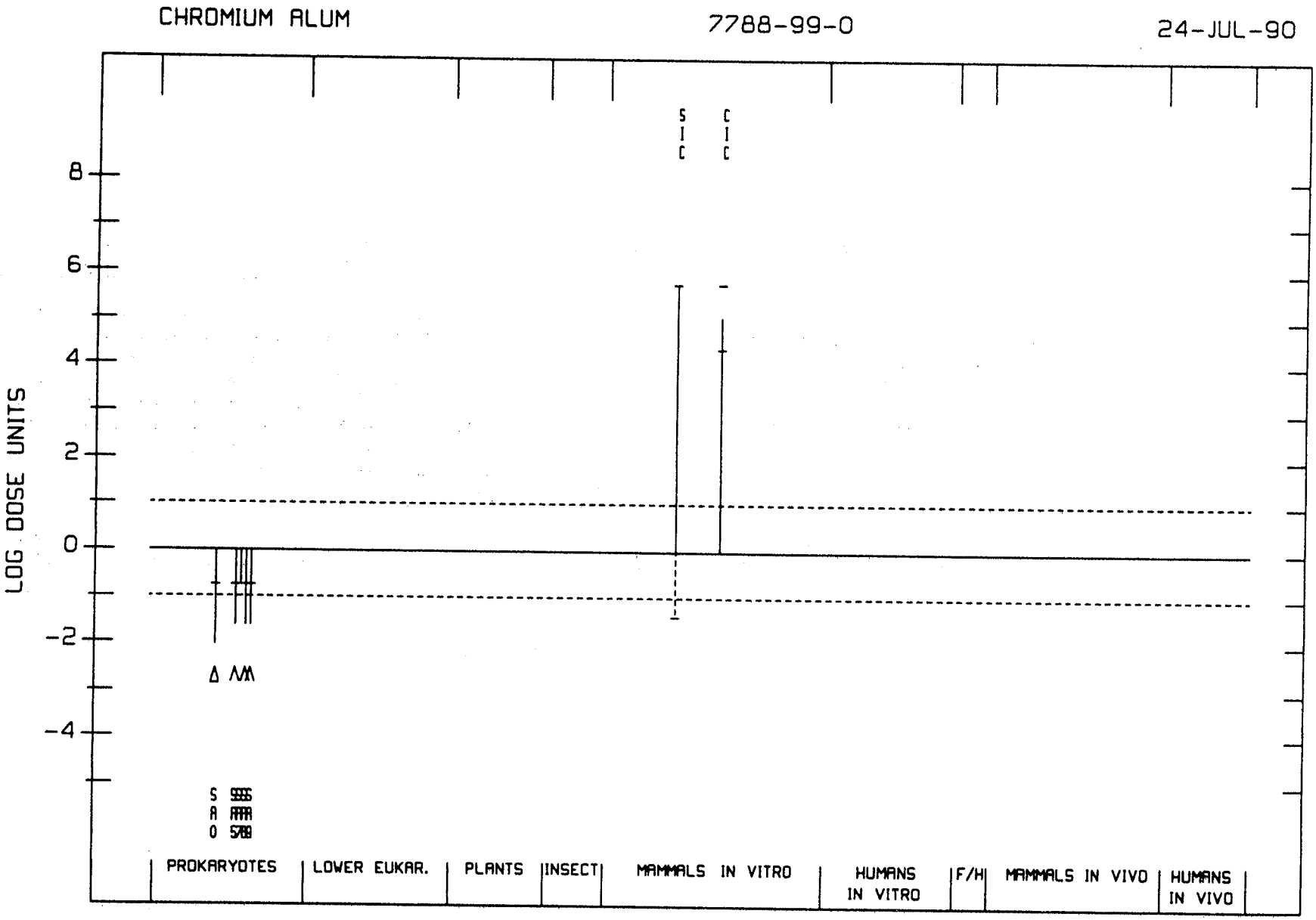
[1]Doses are given as concentrations of the element, not the concentration of the compound.


CHROMIC POTASSIUM SULFATE
10141-00-1
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
ERO
PLU
CIC
SIC
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMIUM ALUM

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	712.0000	PETRILLI & DE FLORA, 1978a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	5.5000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	340.0000	VENIER ET AL., 1982
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	5.5000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	340.0000	VENIER ET AL., 1982
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	5.5000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	5.5000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	340.0000	VENIER ET AL., 1982
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	5.5000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	340.0000	VENIER ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	0.1800	VENIER ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	27.0000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	4.5000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	0.1800	VENIER ET AL., 1982

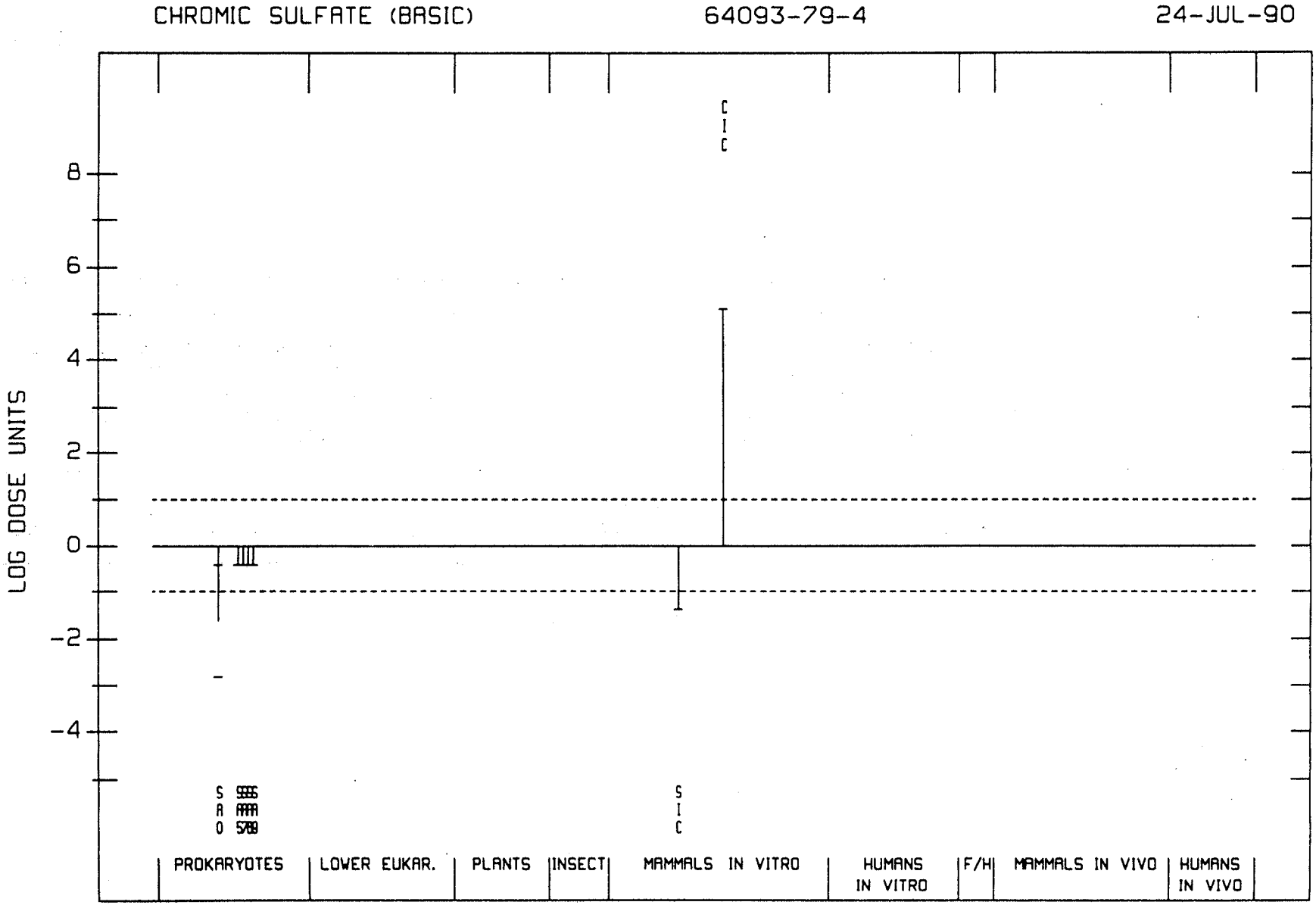
[1]Doses are given as concentrations of the element, not the concentration of the compound.
[2]Contaminated with traces of Cr[VI]


CHROMIUM ALUM
7788-99-0
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

NEOCHROMIUM (CHROMIC SULFATE, BASIC)

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	640.0000	PETRILLI & DE FLORA, 1978a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	2.6000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	2.6000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	2.6000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	2.6000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	2.6000	DE FLORA, 1981a
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	24.0000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.8000	LEVIS & MAJONE, 1981

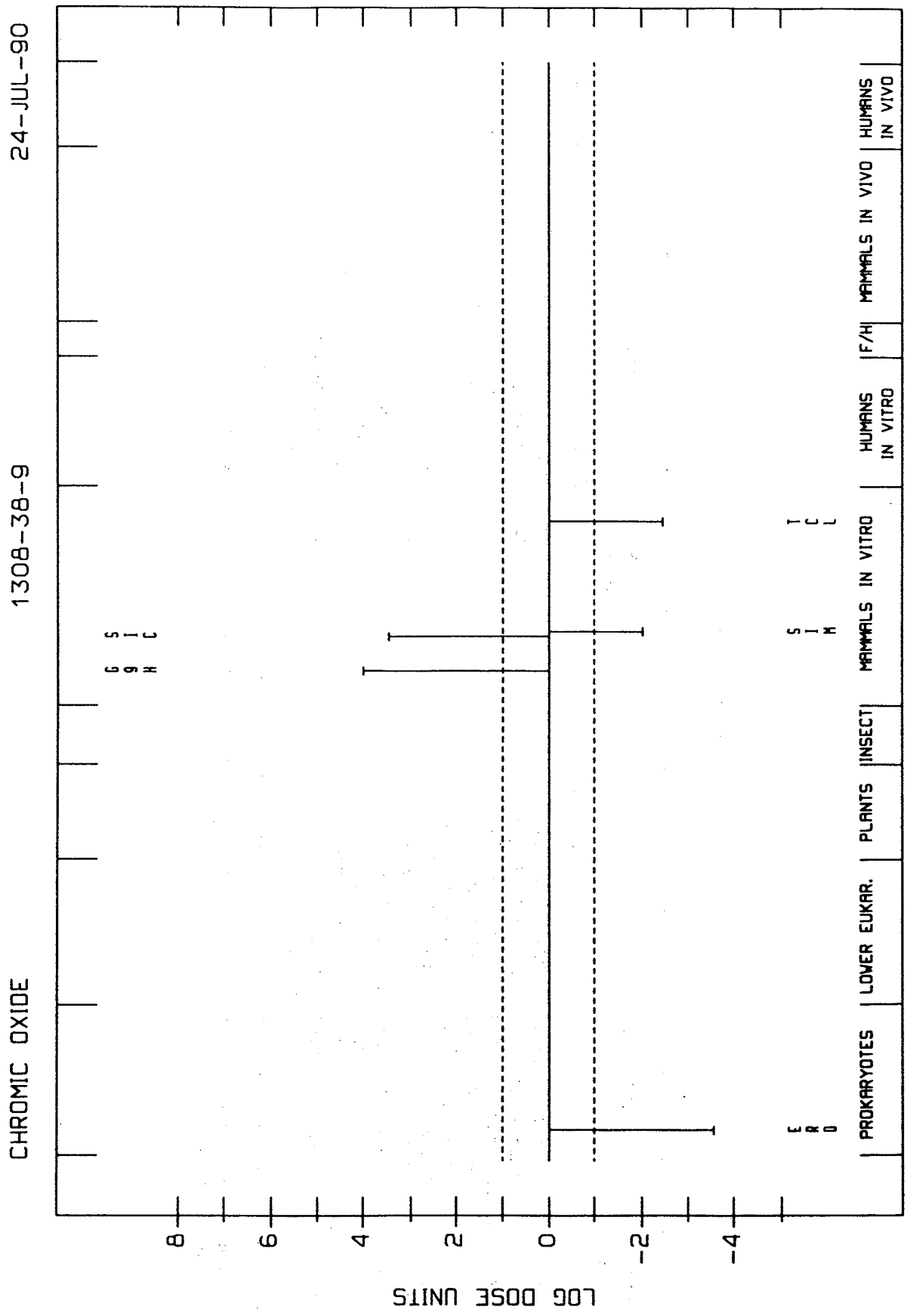
[1]Doses are given as concentrations of the element, not the concentration of the compound.


CHROMIC SULFATE (BASIC)
64093-79-4
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
C
I
C
S
I
C
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMIC OXIDE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	-	0	3760.0000	YAGI & NISHIOKA, 1977
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	10.0000	ELIAS ET AL., 1986
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	34.0000	ELIAS ET AL., 1983
S	SIM	SCE, MOUSE CELLS IN VITRO	-	0	104.0000	ANDERSEN, 1983
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	-	0	274.0000	HANSEN & STERN, 1985

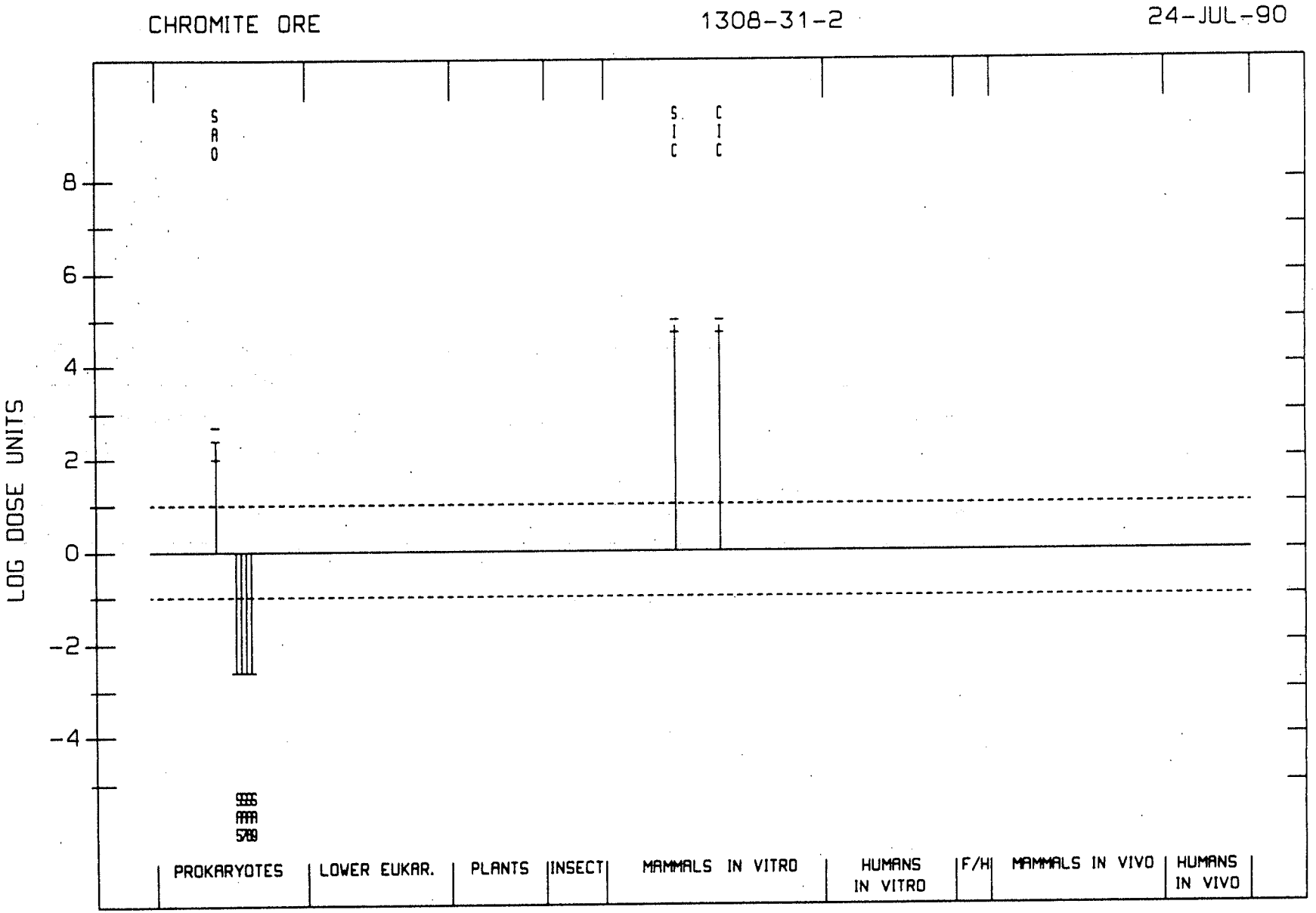
[1]Doses are given as concentrations of the element, not the concentration of the compound.


CHROMIC OXIDE
1308-38-9
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/HI
MAMMALS IN VIVO
HUMANS IN VIVO
GEOMETRIC MEAN
SIMILAR

CHROMITE ORE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	+	0	390.0000	PETRILLI & DE FLORA, 1978a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	+	0	390.0000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	+	+	1000.0000	VENIER ET AL., 1982
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	+	(+)	196:0000	BIANCHI ET AL., 1983
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION[2]	-	0	390.0000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION[2]	-	0	390.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION[2]	-	0	390.0000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION[2]	-	0	390.0000	DE FLORA, 1981a
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	1.9000	VENIER ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	1.0000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	1.0000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	1.9000	VENIER ET AL., 1982

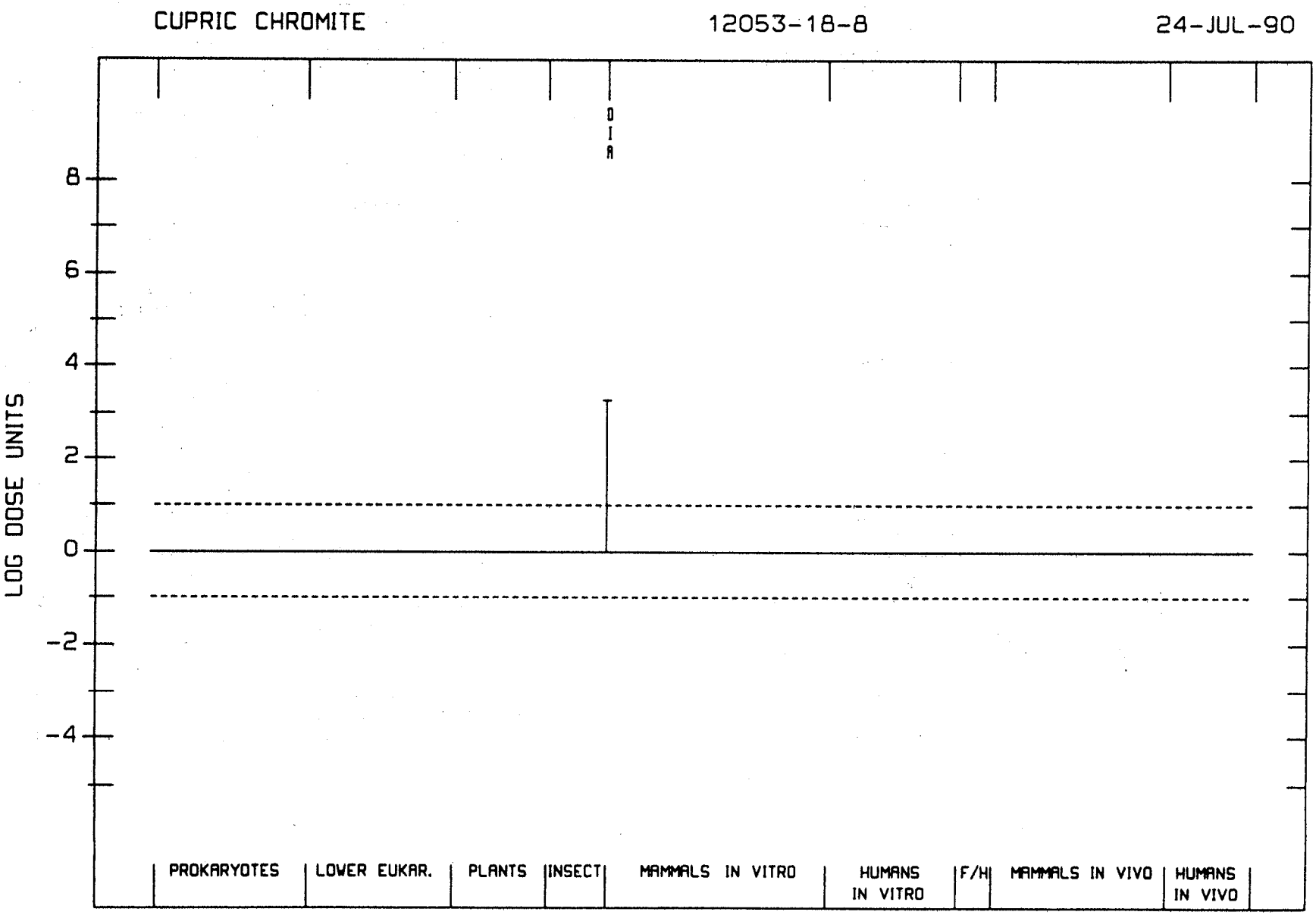
[1]Doses are given as concentrations of the element, not the concentration of the compound.
[2]Contaminated with traces of Cr(VI)


CHROMITE ORE
1308-31-2
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
SAO
SIC
CIC
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CUPRIC CHROMITE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	52.0000	WEDRYCHOWSKI ET AL., 1986a

[1]Doses are given as concentrations of the element, not the concentration of the compound.


CUPRIC CHROMITE
12053-18-8
24-JUL-90
LOG DOSE UNITS
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6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	0	3.5000	LLAGOSTERA ET AL., 1986
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	(+)	0.1000	OLIVIER & MARZIN, 1987
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	(+)	12.0000	VENIER ET AL., 1989
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	(+)	0	76.0000	NAKAMURA ET AL., 1987
D	ECB	E. COLI, STRAND BREAKS/X-LINKS/REPAIR	+	0	90.0000	KALININA & MINSEITOVA, 1983b
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	0	17685.0000	YAGI & NISHIOKA, 1977
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	26.0000	NISHIOKA, 1975
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	166.0000	NAKAMURO ET AL., 1978
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	26.0000	KADA ET AL., 1980
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	260.0000	GENTILE ET AL., 1981
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	1.0000	MATSUI, 1980
D	BRD	BACTERIA (OTHER), DIFFERENTIAL TOXICITY	+	0	260.0000	GENTILE ET AL., 1981
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	4.4000	BIANCHI ET AL., 1983
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	1.7500	VENIER ET AL., 1982
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	0.0000	KANEMATSU ET AL., 1980
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	1.7500	LOPRIENO ET AL., 1985
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	2.8000	GAVA ET AL., 1989b
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	0	0.0006	MARZIN & PHI, 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	7.0000	BIANCHI ET AL., 1983
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	7.0000	VENIER ET AL., 1982
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.0000	KANEMATSU ET AL., 1980
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	7.0000	LOPRIENO ET AL., 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	+	0	1.3000	TAMARO ET AL., 1975
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	0.0000	KANEMATSU ET AL., 1980
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	7.0000	LOPRIENO ET AL., 1985
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	+	0	1.8000	BIANCHI ET AL., 1983
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	7.0000	VENIER ET AL., 1982
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	0.0000	KANEMATSU ET AL., 1980
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	7.0000	LOPRIENO ET AL., 1985
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	+	0	1.3000	TAMARO ET AL., 1975
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	0	1.8000	BIANCHI ET AL., 1983
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	-	1.7500	VENIER ET AL., 1982
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	0.0000	KANEMATSU ET AL., 1980
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	(+)	1.7500	LOPRIENO ET AL., 1985
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	3.5000	GAVA ET AL., 1989b

POTASSIUM DICHROMATE

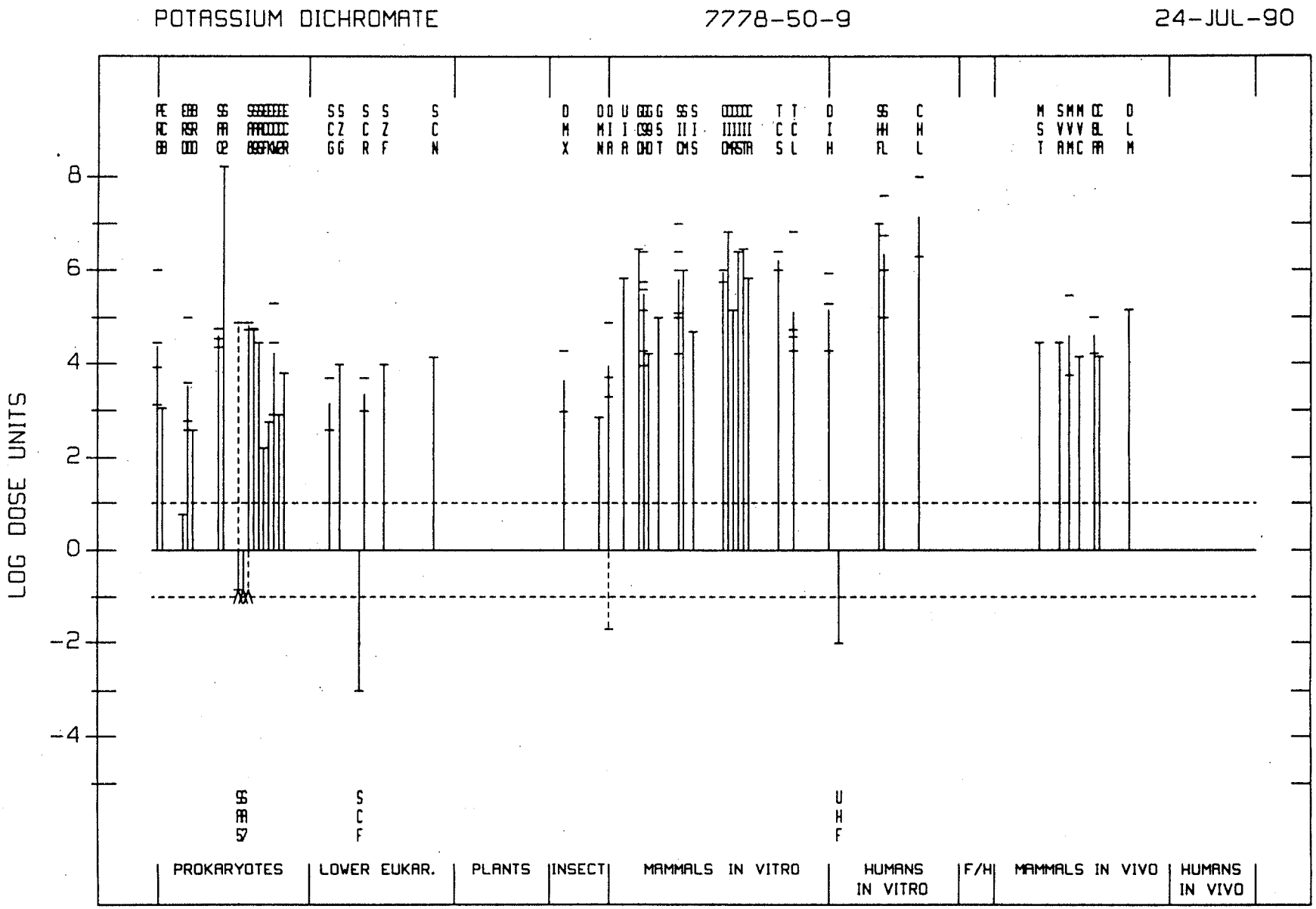
END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	ECF	E. COLI (EXCLUDING K12), FORWARD MUTATION	+	0	0.0000	ZAKOUR & GLICKMAN, 1984
G	ECF	E. COLI (EXCLUDING K12), FORWARD MUTATION	+	0	624.0000	HAYES ET AL., 1984
G	ECK	E. COLI K12, FORWARD OR REVERSE MUTATION	+	0	177.0000	KALININA & MINSEITOVA, 1983b
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	+	0	125:0000	NISHIOKA, 1975
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	+	0	0.5000	VENITT & BOSWORTH, 1983
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	+	0	3.5000	VENIER ET AL., 1987
G	EC2	E. COLI WP2, REVERSE MUTATION	+	0	125.0000	NISHIOKA, 1975
G	EC2	E. COLI WP2, REVERSE MUTATION	+	0	0.0000	KANEMATSU ET AL., 1980
G	ECR	E. COLI (OTHER), REVERSE MUTATION	+	0	16.0000	NAKAMURO ET AL., 1978
R	SCG	S. CEREVISIAE, GENE CONVERSION	+	+	260.0000	GALLI ET AL., 1985
R	SCG	S. CEREVISIAE, GENE CONVERSION	+	0	0.0000	SINGH, 1983
R	SCG	S. CEREVISIAE, GENE CONVERSION	+	0	21.0000	KHARAB & SINGH, 1985
R	SZG	S. POMBE, GENE CONVERSION	+	0	10.4000	BONATTI ET AL., 1976
G	SCF	S. CEREVISIAE, FORWARD MUTATION	-	0	1000.0000	KHARAB & SINGH, 1987
G	SCR	S. CEREVISIAE, REVERSE MUTATION	+	0	104.0000	GALLI ET AL., 1985
G	SCR	S. CEREVISIAE, REVERSE MUTATION	+	0	0.0000	SINGH, 1983
G	SCR	S. CEREVISIAE, REVERSE MUTATION	+	0	21.0000	KHARAB & SINGH, 1985
G	SZF	S. POMBE, FORWARD MUTATION	+	0	10.4000	BONATTI ET AL., 1976
A	SCN	S. CEREVISIAE, ANEUPLOIDY	+	0	7.2000	SORA ET AL., 1986
G	DMX	D. MELANOGASTER, SEX-LINKED RECESSIVES	+	0	106.0000	RODRIGUEZ-ARNAIZ & MOLINA-MARTINEZ, 1986
G	DMX	D. MELANOGASTER, SEX-LINKED RECESSIVES	+	0	5.2000	GAVA ET AL., 1989b
A	DMN	D. MELANOGASTER, ANEUPLOIDY	+	0	140.0000	RODRIGUEZ-ARNAIZ & MOLINA-MARTINEZ, 1986
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	52.0000	WEDRYCHOWSKI ET AL., 1986a
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	20.0000	FORNACE ET AL., 1981
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	-	0	52.0000	BIANCHI ET AL., 1983
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	1.3000	HAMILTON-KOCH ET AL., 1986
D	UIA	UDS, OTHER ANIMAL CELLS IN VITRO	+	0	0.1500	RAFFETTO ET AL., 1977
G	GCO	MUTATION, CHO CELLS IN VITRO	+	0	0.0350	PASCHIN ET AL., 1983
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	0.0400	PASCHIN & KOZACHENKO, 1982
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	0.0400	PASCHIN ET AL., 1983
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	0.0400	PASCHIN ET AL., 1981
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	0.1800	NEWBOLD ET AL., 1979
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	11.0000	RAINALDI ET AL., 1982
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	0.7000	BIANCHI ET AL., 1983
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	0.2600	CELOTTI ET AL., 1987

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	5.2000	HARTWIG & BEYERSMANN, 1987
G	G9O	MUTATION, CHL V79 CELLS, OUABAIN	+	0	6.0000	RAINALDI ET AL., 1982
G	G5T	MUTATION, L5178Y CELLS, TK LOCUS	+	0	1:0000	OBERLY ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.8000	OHNO ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	VENIER ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	MAJONE ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	BIANCHI ET AL., 1983
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	1.0000	UYEKI & NISHIO, 1983
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	LEVIS & MAJONE, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	MAJONE & LEVIS, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0100	MONTALDI ET AL., 1987b
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0400	LOPRIENO ET AL., 1985
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	6.0000	RAINALDI ET AL., 1982
S	SIM	SCE, MOUSE CELLS IN VITRO	+	0	0.1000	MAJONE ET AL., 1983
S	SIM	SCE, MOUSE CELLS IN VITRO	+	0	0.1000	BIANCHI ET AL., 1983
S	SIM	SCE, MOUSE CELLS IN VITRO	+	0	0.1000	ANDERSEN, 1983
S	SIM	SCE, MOUSE CELLS IN VITRO	+	0	0.1000	IIJIMA ET AL., 1983
S	SIS	SCE, SYRIAN HAMSTER CELLS IN VITRO	+	0	2.0000	BIANCHI ET AL., 1984
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	VENIER ET AL., 1982
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	MAJONE & LEVIS, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1800	NEWBOLD ET AL., 1979
C	CIM	CHROM ABERR, MOUSE CELLS IN VITRO	+	0	0.0150	RAFFETTO ET AL., 1977
C	CIR	CHROM ABERR, RAT CELLS IN VITRO	+	0	0.7000	NEWTON & LILLY, 1986
C	CIS	CHROM ABERR, SYRIAN HAMSTER CELLS IN VITRO	+	0	0.0400	TSUDA & KATO, 1977
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	+	0	0.0350	UMEDA & NISHIMURA, 1979
C	CIA	CHROM ABERR, OTHER ANIMAL CELLS IN VITRO	+	0	0.1500	BIGALIEV ET AL., 1977a
T	TCM	CELL TRANSFORMATION, C3H10T1/2 CELLS	-	0	0.5000	PATIERNO ET AL., 1988
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	0.0400	TSUDA & KATO, 1977
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	0.1000	HANSEN & STERN, 1985

POTASSIUM DICHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	0.0150	RAFFETTO ET AL., 1977
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	1.8000	BIANCHI ET AL., 1983
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	2:6000	HANSEN & STERN, 1985
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	5.2000	LANFRANCHI ET AL., 1988
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	+	0	0.1200	SNYDER, 1988
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	+	0	5.2000	MCLEAN ET AL., 1982
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	+	0	0.5200	HAMILTON-KOCH ET AL., 1986
D	UHF	UDS, HUMAN FIBROBLASTS IN VITRO	-	0	104.0000	BIANCHI ET AL., 1983
D	UHF	UDS, HUMAN FIBROBLASTS IN VITRO	-	0	104.0000	BIANCHI ET AL., 1982b
S	SHF	SCE, HUMAN FIBROBLASTS IN VITRO	+	0	0.0100	MACRAE ET AL., 1979
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.0180	GOMEZ-ARROYO ET AL., 1981
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.0025	STELLA ET AL., 1982
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.1000	OGAWA ET AL., 1978
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	1.0000	ANDERSEN, 1983
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	0.0520	NAKAMURO ET AL., 1978
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	0.0010	STELLA ET AL., 1982
G	MST	MOUSE SPOT TEST	+	0	3.5000	KNUDSON, 1980
S	SVA	SCE, ANIMALS IN VIVO	+	0	3.5000	KATHS, 1981
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	+	0	18.0000	FABRY, 1980
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	+	0	0.3500	PASCHIN & TOROPZEV, 1982
M	MVC	MICRONUCLEUS TEST, HAMSTERS IN VIVO	+	0	7.0000	KATHS, 1981
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	-	0	0.7000	PASCHIN ET AL., 1981
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	+	0	6.0000	NEWTON & LILLY, 1986
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	+	0	1.0000	BIGALIEV ET AL., 1977b
A	AVA	ANEUPLOIDY, ANIMAL CELLS IN VIVO	+	0	1.0000	BIGALIEV ET AL., 1977b
C	CLA	CHROM ABERR, ANIMAL LEUCOCYTES IN VIVO	+	0	7.0000	NEWTON & LILLY, 1986
C	DLM	DOMINANT LETHAL TEST, MICE	+	0	0.7000	PASCHIN ET AL., 1982
C	DLM	DOMINANT LETHAL TEST, MICE	-	0	0.5300	PASCHIN ET AL., 1981

[1]Doses are given as concentrations of the element, not the concentration of the compound.


POTASSIUM DICHROMATE
7778-50-9
24-JUL-90
LOG DOSE UNITS
8
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PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

SODIUM DICHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	0	2.0000	DE FLORA ET AL., 1985a
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	0	0.0000	PETRILLI & DE FLORA, 1982
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	+	35.0000	DE FLORA ET AL., 1984a
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	130.0000	GENTILE ET AL., 1981
D	BRD	BACTERIA (OTHER), DIFFERENTIAL TOXICITY	+	0	130.0000	GENTILE ET AL., 1981
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	9.0000	PETRILLI & DE FLORA, 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	-	3.5000	PETRILLI & DE FLORA, 1978b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	-	1.3000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	3.5000	BENNICELLI ET AL., 1983
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	3.5000	DE FLORA, 1978
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	7.0000	DE FLORA & BOIDO, 1980
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.0000	DE FLORA, 1981b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	3.5000	DE FLORA ET AL., 1982
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	4.5000	PETRILLI & DE FLORA, 1982
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.9000	PEDERSEN ET AL., 1983
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	3.5000	PETRILLI ET AL., 1985
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	10.0000	DE FLORA ET AL., 1985b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	5.0000	DE FLORA ET AL., 1985c
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	-	5.0000	PETRILLI ET AL., 1986b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	7.0000	PETRILLI ET AL., 1980
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	5.0000	PETRUZZELLI ET AL., 1989
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	5.0000	DE FLORA ET AL., 1989b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	6.0000	DE FLORA ET AL., 1987b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	-	5.2500	DE FLORA ET AL., 1989c
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	5.0000	DE FLORA ET AL., 1987d
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	+	3.5000	BENNICELLI ET AL., 1983
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	0	0.0000	DE FLORA ET AL., 1984b
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	-	9.0000	DE FLORA ET AL., 1984c
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	0	5.7000	PETRILLI ET AL., 1985
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	0	70.0000	DE FLORA ET AL., 1985a
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	(+)	10.0000	DE FLORA ET AL., 1985b
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	-	5.0000	PETRILLI ET AL., 1986b
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	0	10.0000	DE FLORA ET AL., 1987a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	1.3000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	0.0000	PETRILLI & DE FLORA, 1978b

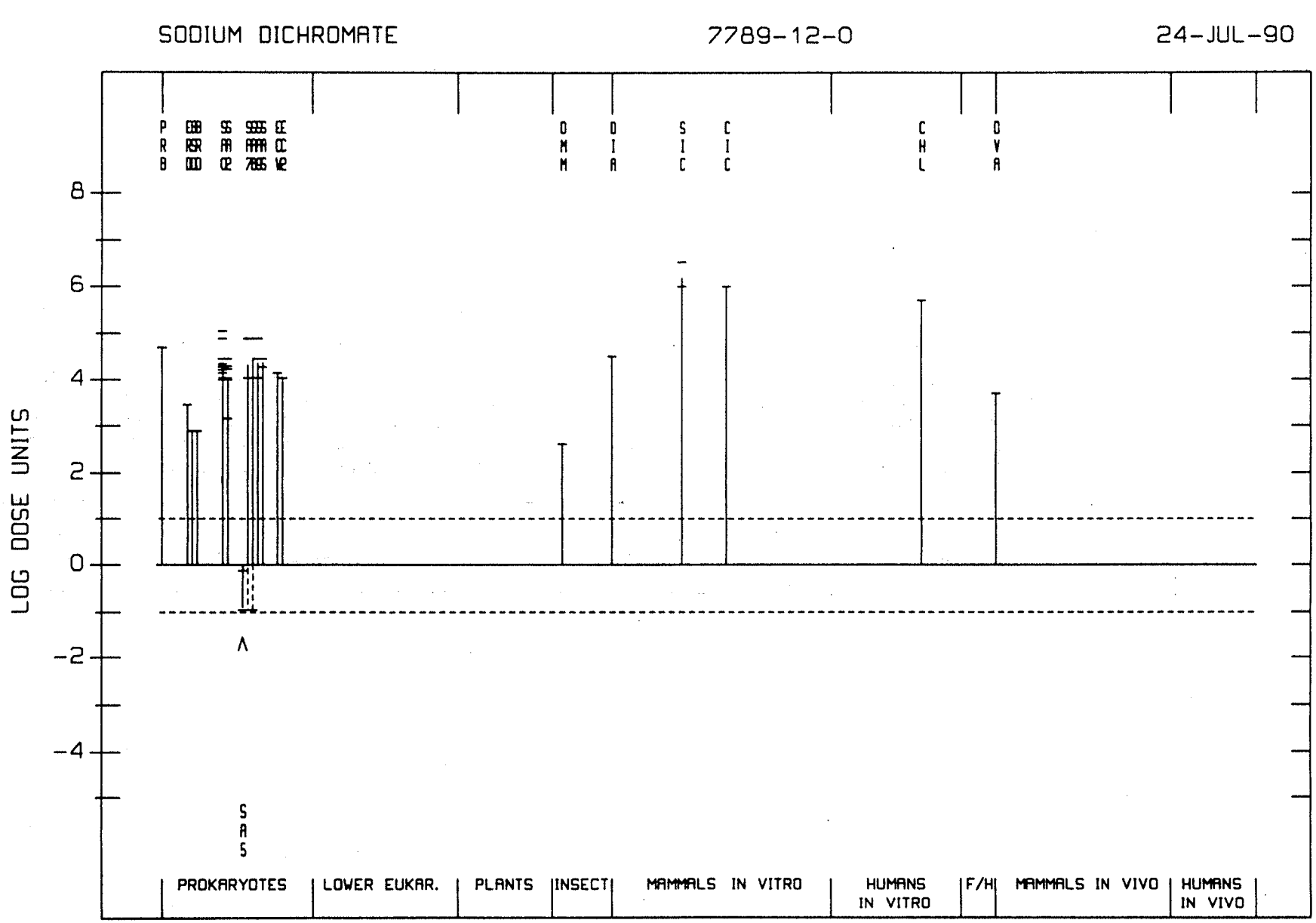
SODIUM DICHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	35.0000	PETRILLI & DE FLORA, 1977
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	9.0000	BENNICELLI ET AL., 1983
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	9.0000	PETRILLI & DE FLORA, 1982
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	+	+	9.0000	PETRILLI & DE FLORA, 1977
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	(+)	-	0.0000	PETRILLI & DE FLORA, 1978b
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	(+)	0	1.3000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	(+)	0	9.0000	BENNICELLI ET AL., 1983
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	9.0000	PETRILLI & DE FLORA, 1982
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	(+)	0	1.3000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	(+)	0	9.0000	BENNICELLI ET AL., 1983
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	9.0000	PETRILLI & DE FLORA, 1982
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	-	0.0000	PETRILLI & DE FLORA, 1978b
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	+	9.0000	PETRILLI & DE FLORA, 1977
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	0	1.3000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	0	3.5000	BENNICELLI ET AL., 1983
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	+	9.0000	PETRILLI & DE FLORA, 1982
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	0.0000	DE FLORA ET AL., 1984a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	3.5000	PETRILLI & DE FLORA, 1982
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	0.0000	DE FLORA ET AL., 1984b
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	5.2500	BENNICELLI ET AL., 1983
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	+	0	7.0000	PETRILLI & DE FLORA, 1982
G	EC2	E. COLI WP2, REVERSE MUTATION	+	0	9.0000	PETRILLI & DE FLORA, 1982
G	DMM	D. MELANOGASTER, SOMATIC MUTAT/RECOMB	+	0	244.0000	RASMUSON, 1985
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	3.1000	SINA ET AL., 1983
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	LEVIS & MAJONE, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0300	ELIAS ET AL., 1983
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	MAJONE & LEVIS, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	MAJONE & LEVIS, 1979

SODIUM DICHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	0.2000	SARTO ET AL., 1980
D	DVA	STRAND BREAKS/X-LINKS, ANIMALS IN VIVO	+	0	20.0000	TSAPAKOS ET AL., 1981
D	DVA	STRAND BREAKS/X-LINKS, ANIMALS IN VIVO	+	0	20.0000	TSAPAKOS ET AL., 1983a
C	FSC	FISH, CHROM ABERR	+	0	1.0000	KRISHNAJA & REGE, 1982

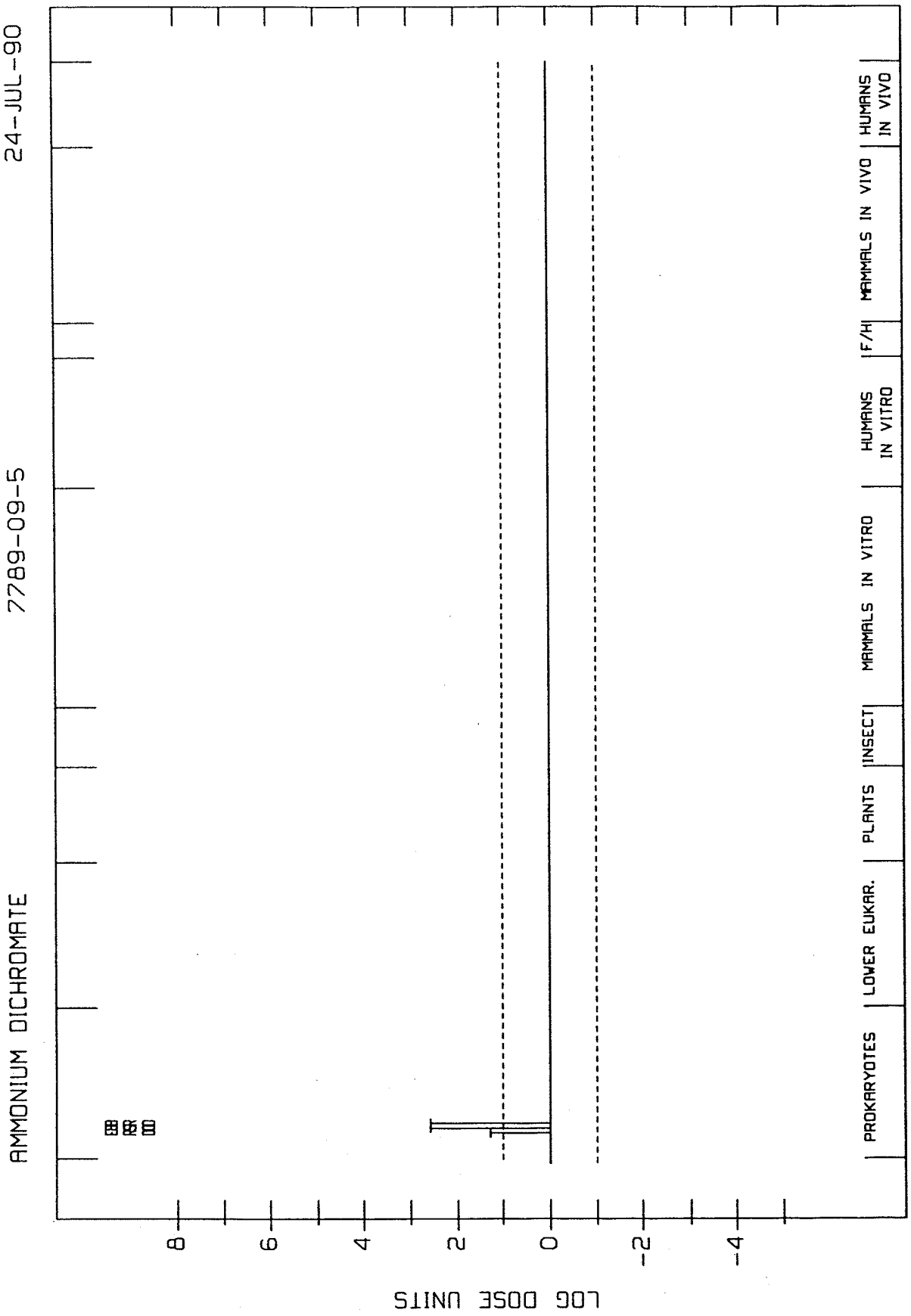
[1]Doses are given as concentrations of the element, not the concentration of the compound.


SODIUM DICHROMATE
7789-12-0
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PRB
SAS
DMM
DIA
SIC
CIC
CHL
OVA
A
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

AMMONIUM DICHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	0	5200.0000	YAGI & NISHIOKA, 1977
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	260.0000	GENTILE ET AL., 1981
D	BRD	BACTERIA (OTHER), DIFFERENTIAL TOXICITY	+	0	260.0000	GENTILE ET AL., 1981

[1]Doses are given as concentrations of the element, not the concentration of the compound.


24-JUL-90
7789-09-5
AMMONIUM DICHROMATE
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO
8
6
4
2
0
-2
-4
LOG DOSE UNITS

POTASSIUM CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	0	0.2000	ROSSMAN ET AL., 1984
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	0	13.0000	LLAGOSTERA ET AL., 1986
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	(+)	0.3000	OLIVIER & MARZIN, 1987
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	(+)	18.0000	VENIER ET AL., 1989
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	+	40.0000	DE FLORA ET AL., 1984a
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	0	5360.0000	YAGI & NISHIOKA, 1977
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	130.0000	NISHIOKA, 1975
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	52.0000	NAKAMURO ET AL., 1978
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	13.0000	KADA ET AL., 1980
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	–	5.4000	PETRILLI & DE FLORA, 1978b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	2.0000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	1300.0000	BEYERSMANN ET AL., 1984
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.2000	BAKER ET AL., 1984
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.2400	ARLAUSKAS ET AL., 1985
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.0100	LANGERWERF ET AL., 1985
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	0	0.0007	MARZIN & PHI, 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	–	0	2.0000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	–	–	11.0000	PETRILLI & DE FLORA, 1978b
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	(+)	0	5.0000	TAMARO ET AL., 1975
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	+	–	5.4000	PETRILLI & DE FLORA, 1978b
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	(+)	0	2.0000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	+	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	(+)	0	2.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	(+)	0	2.5000	TAMARO ET AL., 1975
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	–	5.4000	PETRILLI & DE FLORA, 1978b
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	0	2.0000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	–	0	0.0100	LANGERWERF ET AL., 1985
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	0.0000	DE FLORA ET AL., 1984a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	0.0050	LANGERWERF ET AL., 1985
G	ECF	E. COLI (EXCLUDING K12), FORWARD MUTATION	–	–	0.3600	LA VELLE, 1986a
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	+	0	0.0025	VENITT & LEVY, 1974
G	EC2	E. COLI WP2, REVERSE MUTATION	+	0	0.1300	GREEN ET AL., 1976
G	EC2	E. COLI WP2, REVERSE MUTATION	+	0	0.0025	VENITT & LEVY, 1974
G	ECR	E. COLI (OTHER), REVERSE MUTATION	+	0	0.0025	VENITT & LEVY, 1974

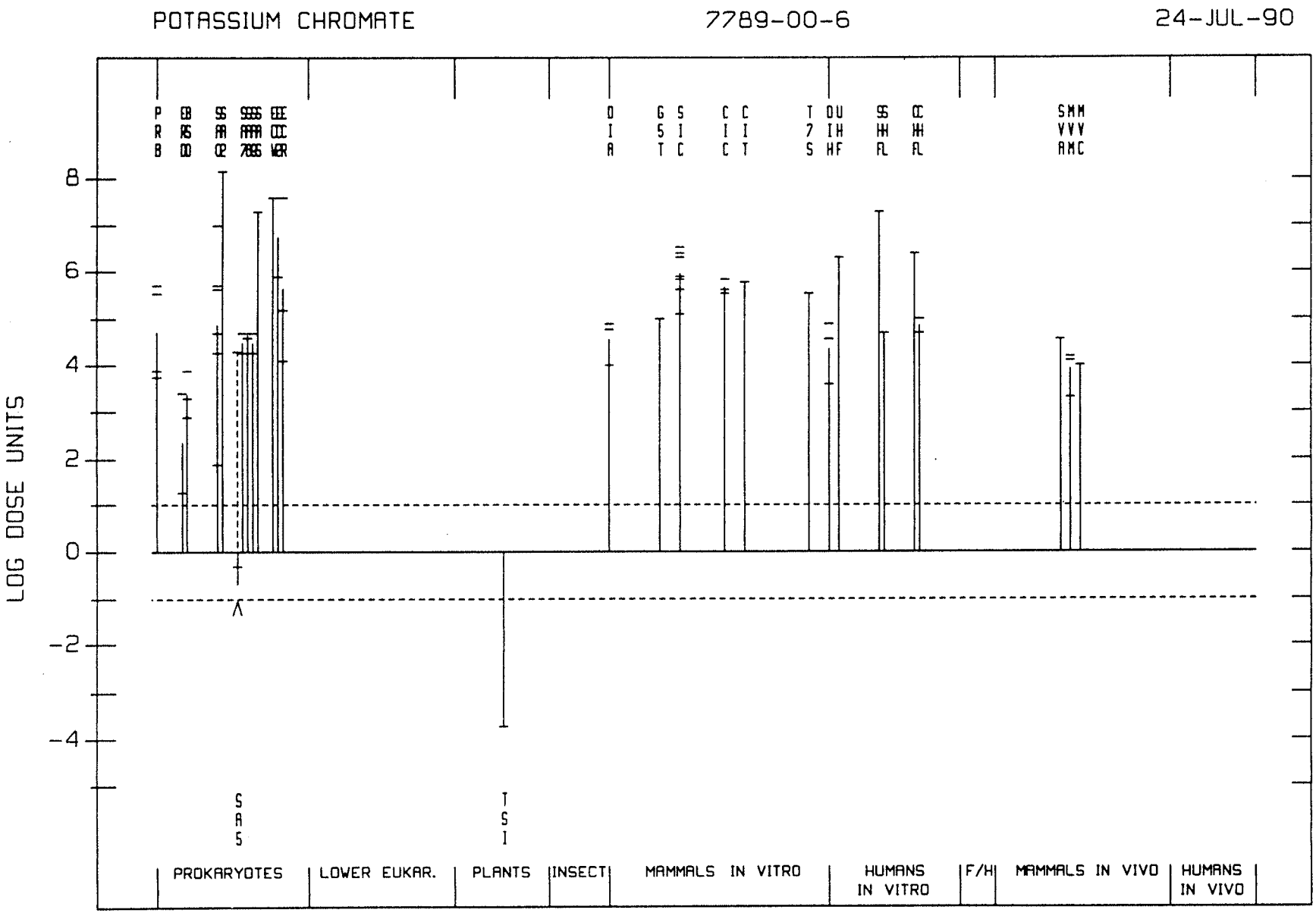
POTASSIUM CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	ECR	E. COLI (OTHER), REVERSE MUTATION	+	0	0.6500	ARLAUSKAS ET AL., 1985
G	ECR	E. COLI (OTHER), REVERSE MUTATION	+	0	8.0000	NAKAMURO ET AL., 1978
M	TSI	TRADESCANTIA SPECIES, MICRONUCLEI	-	0	5200.0000	MA ET AL., 1984
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	1:3000	FORNACE ET AL., 1981
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	1.7000	MILLER & COSTA, 1988
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	10.0000	WEDRYCHOWSKI ET AL., 1986b
G	G5T	MUTATION, L5178Y CELLS, TK LOCUS	+	0	1.0000	OBERLY ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1500	MAJONE & RENSI, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0400	MACRAE ET AL., 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.2500	LEVIS & MAJONE, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.8000	OHNO ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0300	ELIAS ET AL., 1983
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0500	MAJONE ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1300	PRICE-JONES ET AL., 1980
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.2500	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1500	MAJONE & RENSI, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.3000	KOSHI & IWASAKI, 1983
A	AIA	ANEUPLOIDY, ANIMAL CELLS IN VITRO	-	0	0.1300	PRICE-JONES ET AL., 1980
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	+	0	0.1700	UMEDA & NISHIMURA, 1979
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	-	0	0.1400	RIVEDAL & SANNER, 1981
T	T7S	CELL TRANSFORMATION, SA7/SHE CELLS	+	0	0.3000	CASTO ET AL., 1979
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	+	0	26.0000	WHITING ET AL., 1979
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	+	0	2.7000	FORNACE, 1982
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	+	0	1.3000	FORNACE ET AL., 1981
D	UHF	UDS, HUMAN FIBROBLASTS IN VITRO	+	0	0.0500	WHITING ET AL., 1979
D	UHF	UDS, HUMAN FIBROBLASTS IN VITRO	+	0	0.0050	MACRAE ET AL., 1979
S	SHF	SCE, HUMAN FIBROBLASTS IN VITRO	+	0	2.0000	DOUGLAS ET AL., 1980
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.0400	MACRAE ET AL., 1979
C	CHF	CHROM ABERR, HUMAN FIBROBLASTS IN VITRO	+	0	2.0000	NAKAMURO ET AL., 1978
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	1.0000	DOUGLAS ET AL., 1980
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	2.7000	KATHS, 1981
S	SVA	SCE, ANIMALS IN VIVO	+	0	6.5000	WILD, 1978
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO				

POTASSIUM CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	+	0	50.0000	HAYASHI ET AL., 1982
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	+	0	8.0000	COLLABORATIVE STUDY GROUP, 1986
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	+	0	8.0000	COLLABORATIVE STUDY GROUP, 1988
M	MVC	MICRONUCLEUS TEST, HAMSTERS IN VIVO	+	0	10.0000	KATHS, 1981

[1]Doses are given as concentrations of the element, not the concentration of the compound.


POTASSIUM CHROMATE
7789-00-6
24-JUL-90
LOG DOSE UNITS
8
6
4
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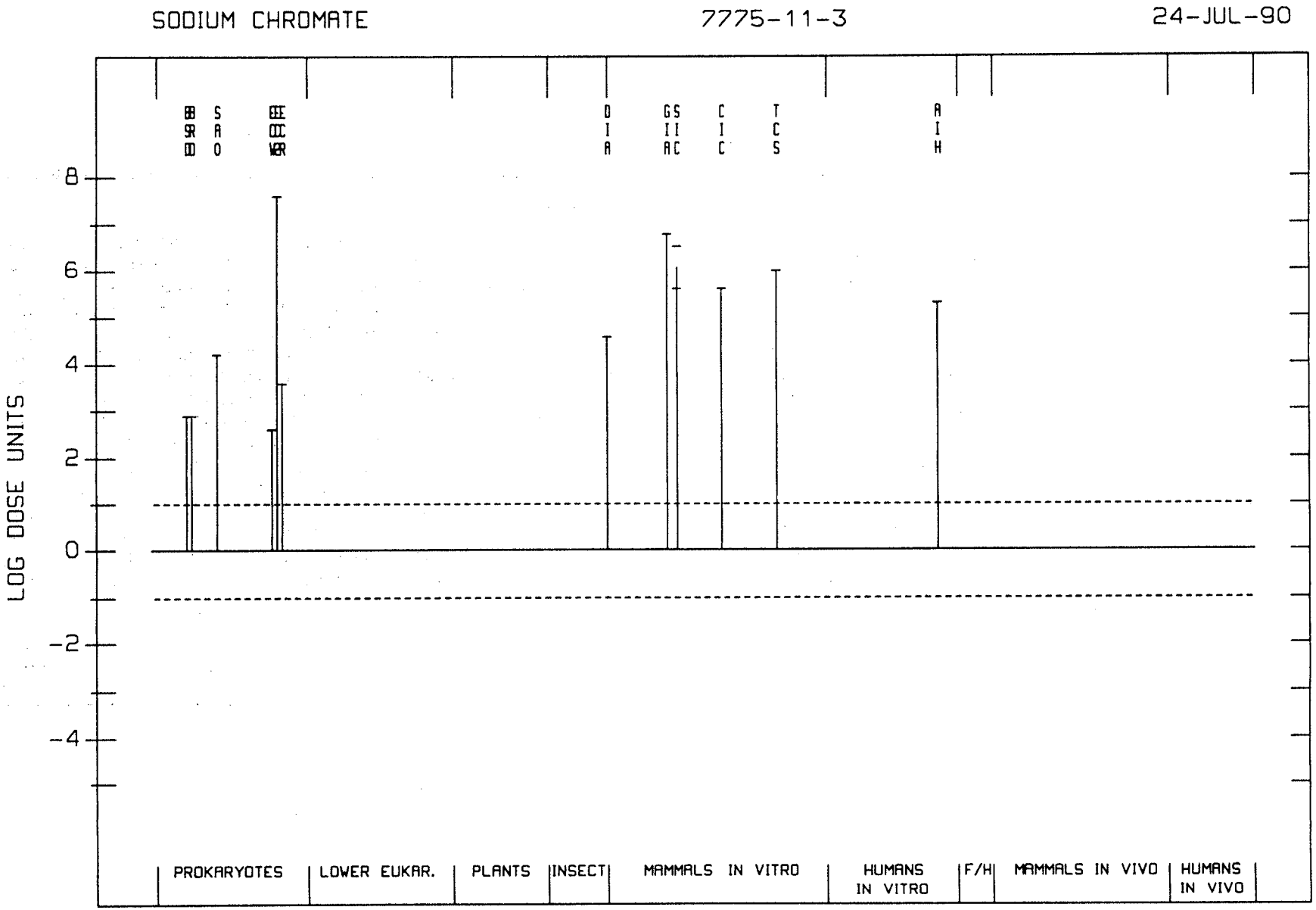
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

SODIUM CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	130.0000	GENTILE ET AL., 1981
D	BRD	BACTERIA (OTHER), DIFFERENTIAL TOXICITY	+	0	130.0000	GENTILE ET AL., 1981
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	6.0000	LOPRIENO ET AL., 1985
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	+	0	250:0000	VENITT & LEVY, 1974
G	EC2	E. COLI WP2, REVERSE MUTATION	+	0	0.0025	VENITT & LEVY, 1974
G	ECR	E. COLI (OTHER), REVERSE MUTATION	+	0	26.0000	MOHN & ELLENBERGER, 1977
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	2.6000	SUGIYAMA ET AL., 1987
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	2.6000	SUGIYAMA ET AL., 1988
G	GIA	MUTATION, OTHER ANIMAL CELLS IN VITRO	+	0	0.0160	BIGGART & MURPHY, 1988
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.2500	LEVIS & MAJONE, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0300	ELIAS ET AL., 1983
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.2500	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	0.1000	DIPAOLO & CASTO, 1979
A	AIH	ANEUPLOIDY, HUMAN CELLS IN VITRO	+	0	0.5000	NIJS & KIRSCH-VOLDERS, 1986

[1]Doses are given as concentrations of the element, not the concentration of the compound.


SODIUM CHROMATE
7775-11-3
24-JUL-90
LOG DOSE UNITS
8
6
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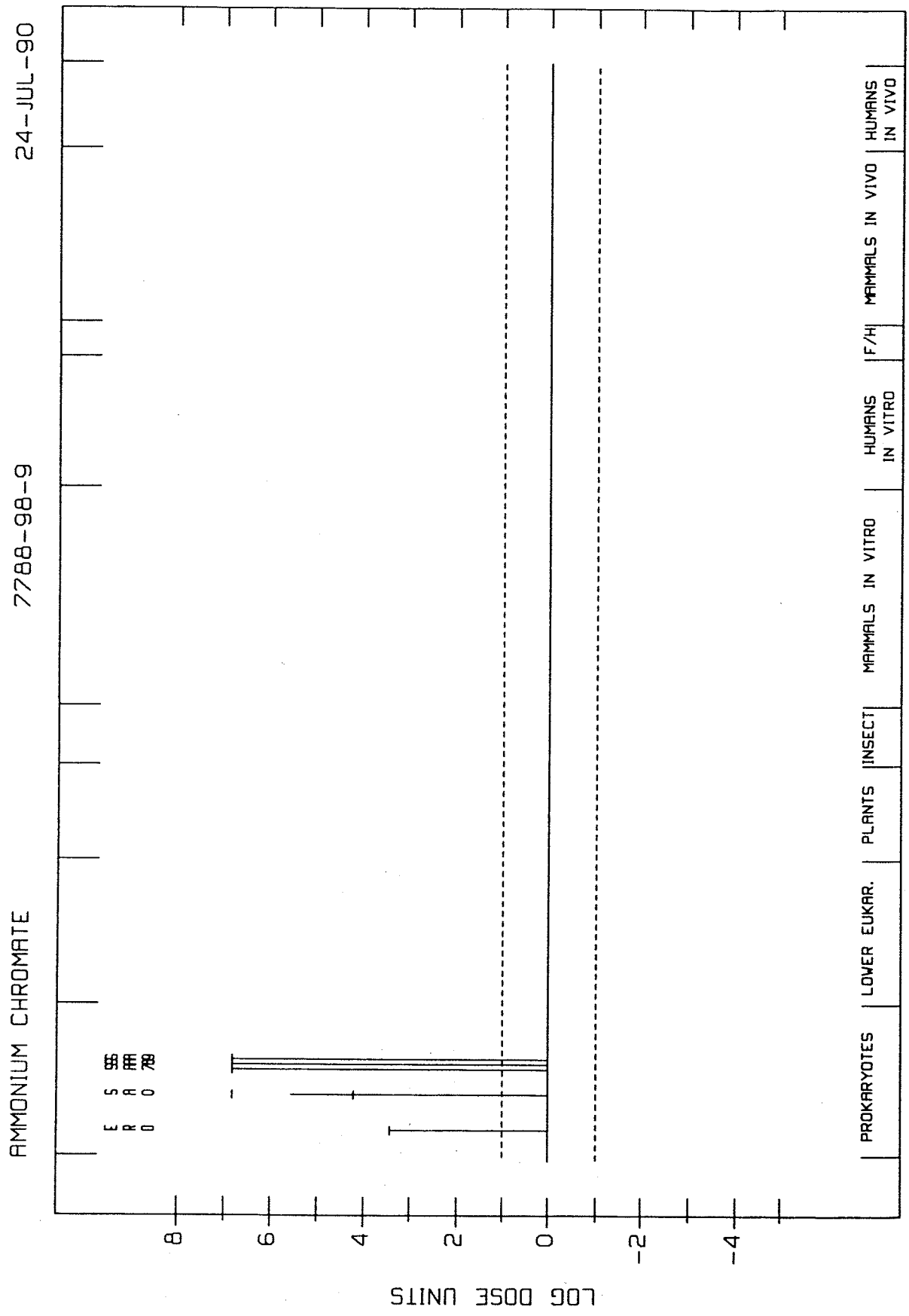
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

AMMONIUM CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	+	38.0000	DE FLORA ET AL., 1984a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.0150	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	6.0000	DE FLORA ET AL., 1987c
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0:0150	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	(+)	0	0.0150	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	(+)	0	0.0150	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	0	0.0150	DE FLORA, 1981a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	0.0000	DE FLORA ET AL., 1984a

[1]Doses are given as concentrations of the element, not the concentration of the compound.


AMMONIUM CHROMATE
7788-98-9
24-JUL-90
LOG DOSE UNITS
8
6
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0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

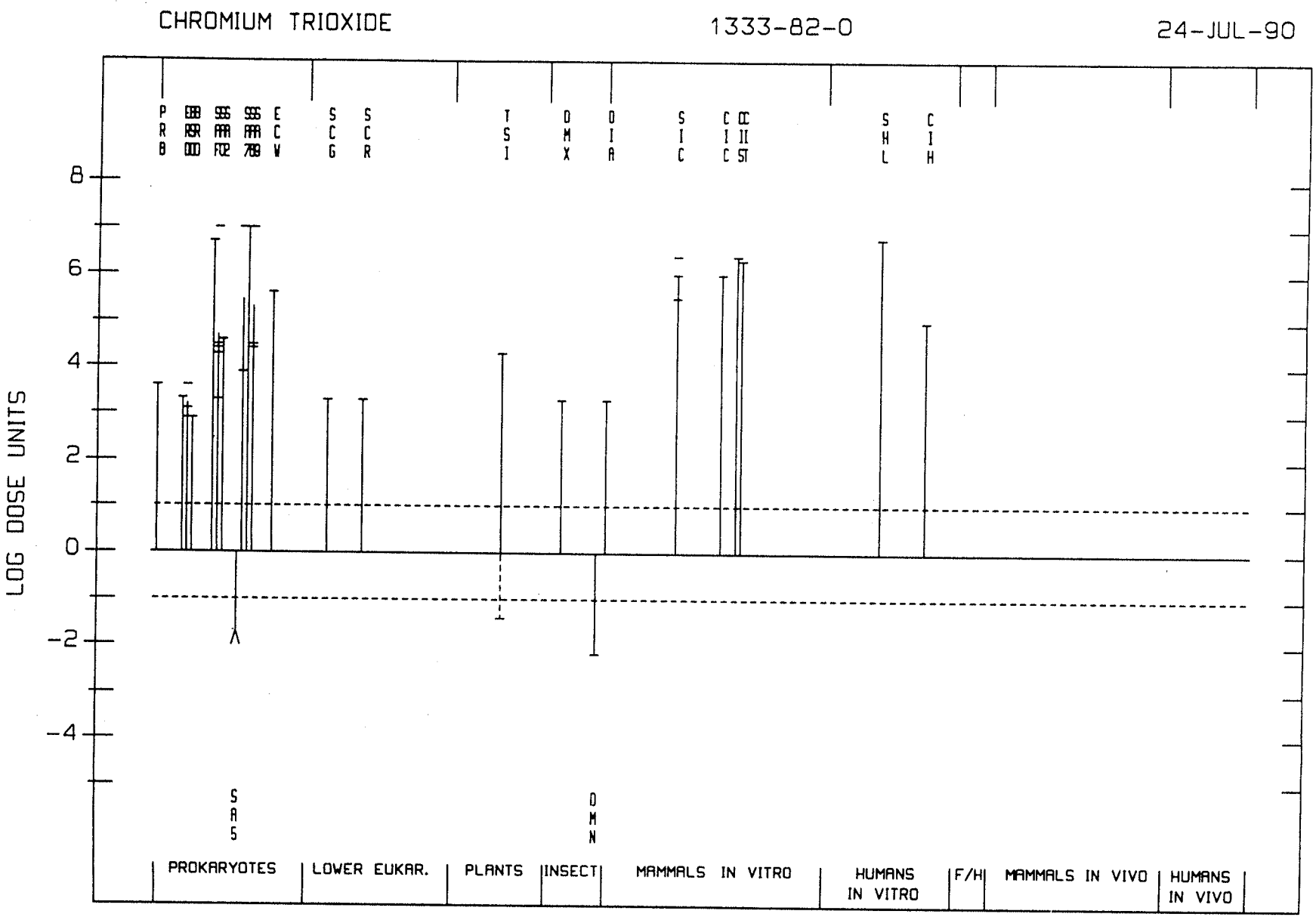
CHROMIUM TRIOXIDE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	+	0	26.0000	LLAGOSTERA ET AL., 1986
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	+	50.0000	DE FLORA ET AL., 1984a
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	83.0000	NAKAMURO ET AL., 1978
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	26.0000	KADA ET AL., 1980
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	+	0	130.0000	GENTILE ET AL., 1981
D	BRD	BACTERIA (OTHER), DIFFERENTIAL TOXICITY	+	0	130.0000	GENTILE ET AL., 1981
G	SAF	S. TYPHIMURIUM, FORWARD MUTATION	+	0	0.0200	RUIZ-RUBIO ET AL., 1985
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	3.2500	PETRILLI & DE FLORA, 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	3.9000	NESTMANN ET AL., 1979
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.0100	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	52.0000	TSO & FUNG, 1981
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	5.2000	DE FLORA ET AL., 1987c
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	+	2.6000	BENNICELLI ET AL., 1983
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	0	2.5000	PETRILLI ET AL., 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	−	0	0.0100	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	−	−	52.0000	PETRILLI & DE FLORA, 1977
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	+	+	13.0000	PETRILLI & DE FLORA, 1977
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	(+)	0	0.0100	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	(+)	0	0.0100	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	+	3.2500	PETRILLI & DE FLORA, 1977
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	+	3.9000	NESTMANN ET AL., 1979
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	0	0.0100	DE FLORA, 1981a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	0.0000	DE FLORA ET AL., 1984a
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	+	0	0.2500	NESTMANN ET AL., 1979
G	EC2	E. COLI WP2, REVERSE MUTATION	−	0	0.0000	KANEMATSU ET AL., 1980
R	SCG	S. CEREVISIAE, GENE CONVERSION	+	0	52.0000	FUKUNAGA ET AL., 1982
G	SCR	S. CEREVISIAE, REVERSE MUTATION	−	0	52.0000	FUKUNAGA ET AL., 1982
M	TSI	TRADESCANTIA SPECIES, MICRONUCLEI	−	0	26.0000	MA ET AL., 1984
M	TSI	TRADESCANTIA SPECIES, MICRONUCLEI	+	0	5.0000	ZHANG ET AL., 1984
G	DMX	D. MELANOGASTER, SEX-LINKED RECESSIVES	+	0	52.0000	RODRIGUEZ-ARNAIZ & MOLINA-MARTINEZ, 1986
A	DMN	D. MELANOGASTER, ANEUPLOIDY	−	0	156.0000	RODRIGUEZ-ARNAIZ & MOLINA-MARTINEZ, 1986
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	52.0000	WEDRYCHOWSKI ET AL., 1986a
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	LEVIS & MAJONE, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0400	KOSHI, 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.3200	OHNO ET AL., 1982

CHROMIUM TRIOXIDE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0000	BIANCHI ET AL., 1980
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	KOSHI, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0:0000	BIANCHI ET AL., 1980
C	CIS	CHROM ABERR, SYRIAN HAMSTER CELLS IN VITRO	+	0	0.0400	TSUDA & KATO, 1977
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	+	0	0.0500	UMEDA & NISHIMURA, 1979
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.0170	GOMEZ-ARROYO ET AL., 1981
C	CIH	CHROM ABERR, OTHER HUMAN CELLS IN VITRO	+	0	1.0000	KANEKO, 1976

[1]Doses are given as concentrations of the element, not the concentration of the compound.

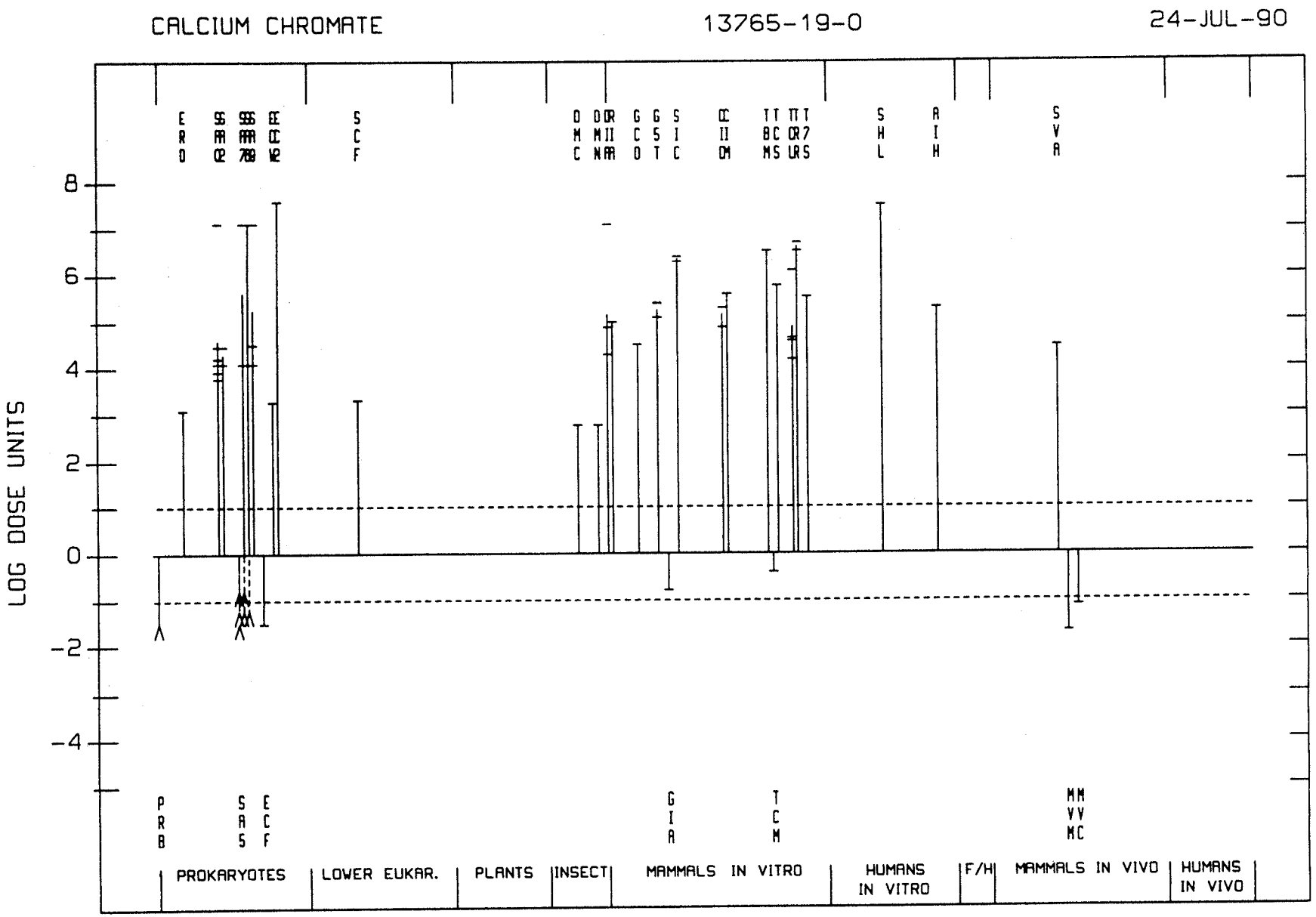

CHROMIUM TRIOXIDE
1333-82-0
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	-	32.0000	BRAMS ET AL., 1987
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	+	83.0000	DE FLORA ET AL., 1984a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	6.0000	HAWORTH ET AL., 1983
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	8:0000	PETRILLI & DE FLORA, 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.0075	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	-	3.3000	VENIER ET AL., 1985b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	17.0000	DUNKEL ET AL., 1984
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	12.0000	DE FLORA ET AL., 1987c
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	(+)	3.3000	BENNICELLI ET AL., 1983
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	0	8.0000	PETRILLI ET AL., 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	33.0000	PETRILLI & DE FLORA, 1977
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.0075	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	6.0000	HAWORTH ET AL., 1983
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	17.0000	DUNKEL ET AL., 1984
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	6.0000	HAWORTH ET AL., 1983
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	+	+	8.0000	PETRILLI & DE FLORA, 1977
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	(+)	0	0.0075	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	17.0000	DUNKEL ET AL., 1984
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	(+)	0	0.0075	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	17.0000	DUNKEL ET AL., 1984
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	(+)	3.0000	HAWORTH ET AL., 1983
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	+	8.0000	PETRILLI & DE FLORA, 1977
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	0	0.0075	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	?	17.0000	DUNKEL ET AL., 1984
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	0	0.0000	DE FLORA ET AL., 1984a
G	ECF	E. COLI (EXCLUDING K12), FORWARD MUTATION	-	0	33.0000	CORBETT ET AL., 1970
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION	+	+	55.0000	DUNKEL ET AL., 1984
G	EC2	E. COLI WP2, REVERSE MUTATION	+	0	0.0025	VENITT & LEVY, 1974
G	SCF	S. CEREVISIAE, FORWARD MUTATION	+	0	50.0000	EGILSSON ET AL., 1979
C	DMC	D. MELANOGASTER, CHROM ABERR	+	0	167.0000	ZIMMERING, 1983
A	DMN	D. MELANOGASTER, ANEUPLOIDY	+	0	167.0000	ZIMMERING, 1983
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	1.3000	ROBISON ET AL., 1982
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	5.0000	ROBISON ET AL., 1984
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	0.0080	CANTONI & COSTA, 1984
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	5.0000	CHRISTIE ET AL., 1984

CALCIUM CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	1.0500	SUGIYAMA ET AL., 1986b
D	RIA	OTHER DNA REPAIR, ANIMAL CELLS IN VITRO	+	0	1.0000	ROBISON ET AL., 1984
G	GCO	MUTATION, CHO CELLS IN VITRO	+	0	3.0000	PATIERNO ET AL., 1988
G	G5T	MUTATION, L5178Y CELLS, TK LOCUS	+	+	0:4000	MCGREGOR ET AL., 1987
G	G5T	MUTATION, L5178Y CELLS, TK LOCUS	+	+	0.8000	MYHR & CASPARY, 1988
G	GIA	MUTATION, OTHER ANIMAL CELLS IN VITRO	-	0	6.0000	PATIERNO ET AL., 1988
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0520	SEN & COSTA, 1986
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0400	VENIER ET AL., 1985b
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.5000	LEVIS & MAJONE, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	1.3000	SEN ET AL., 1987
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.5000	KOSHI & IWASAKI, 1983
C	CIM	CHROM ABERR, MOUSE CELLS IN VITRO	+	0	0.2600	SEN ET AL., 1987
T	TBM	CELL TRANSFORMATION, BALB/C3T3 CELLS	+	0	0.0300	DUNKEL ET AL., 1981
T	TCM	CELL TRANSFORMATION, C3H10T1/2 CELLS	-	0	2.5000	PATIERNO ET AL., 1988
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	0.1700	DUNKEL ET AL., 1981
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	0.0800	FRADKIN ET AL., 1975
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	2.2000	BIANCHI ET AL., 1983
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	2.5000	HANSEN & STERN, 1985
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	6.5000	LANFRANCHI ET AL., 1988
T	TRR	CELL TRANSFORMATION, RLV/FISCHER RAT	+	0	0.0200	DUNKEL ET AL., 1981
T	TRR	CELL TRANSFORMATION, RLV/FISCHER RAT	+	0	0.0300	TRAUL ET AL., 1981
T	T7S	CELL TRANSFORMATION, SA7/SHE CELLS	+	0	0.3000	CASTO ET AL., 1979
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	+	0	1.0500	SUGIYAMA ET AL., 1986b
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.0030	GOMEZ-ARROYO ET AL., 1981
A	AIH	ANEUPLOIDY, HUMAN CELLS IN VITRO	+	0	0.5000	NIJS & KIRSCH-VOLDERS, 1986
S	SVA	SCE, ANIMALS IN VIVO	+	0	3.3000	KATHS, 1981
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	-	0	50.0000	FABRY, 1980
M	MVC	MICRONUCLEUS TEST, HAMSTERS IN VIVO	-	0	13.3000	KATHS, 1981

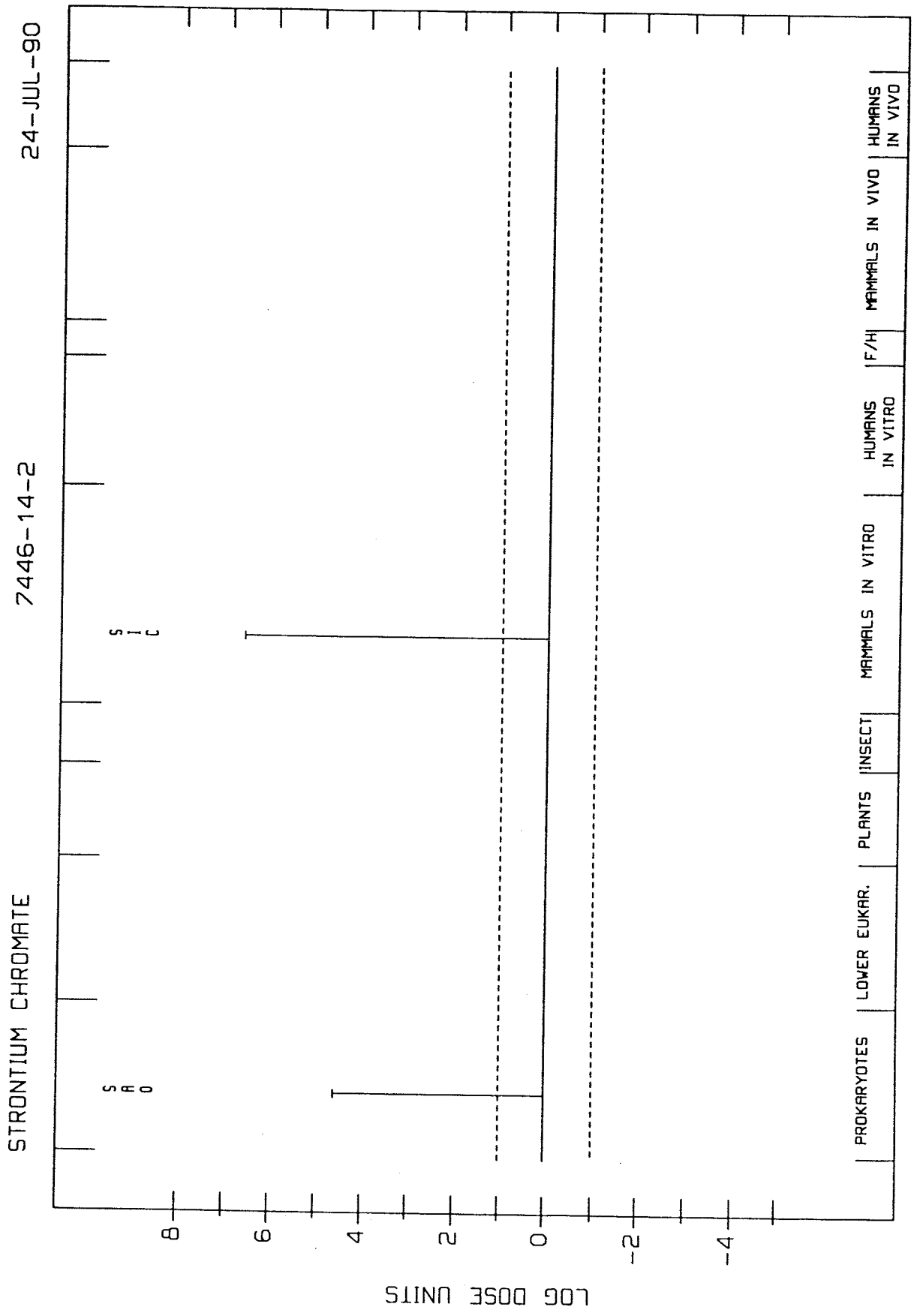
[1]Doses are given as concentrations of the element, not the concentration of the compound.


CALCIUM CHROMATE
13765-19-0
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

STRONTIUM CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	-	2.5000	VENIER ET AL., 1985b
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0250	VENIER ET AL., 1985b
T	TCM	CELL TRANSFORMATION, C3H10T1/2 CELLS	-	0	1.0000	PATIERNO ET AL., 1988

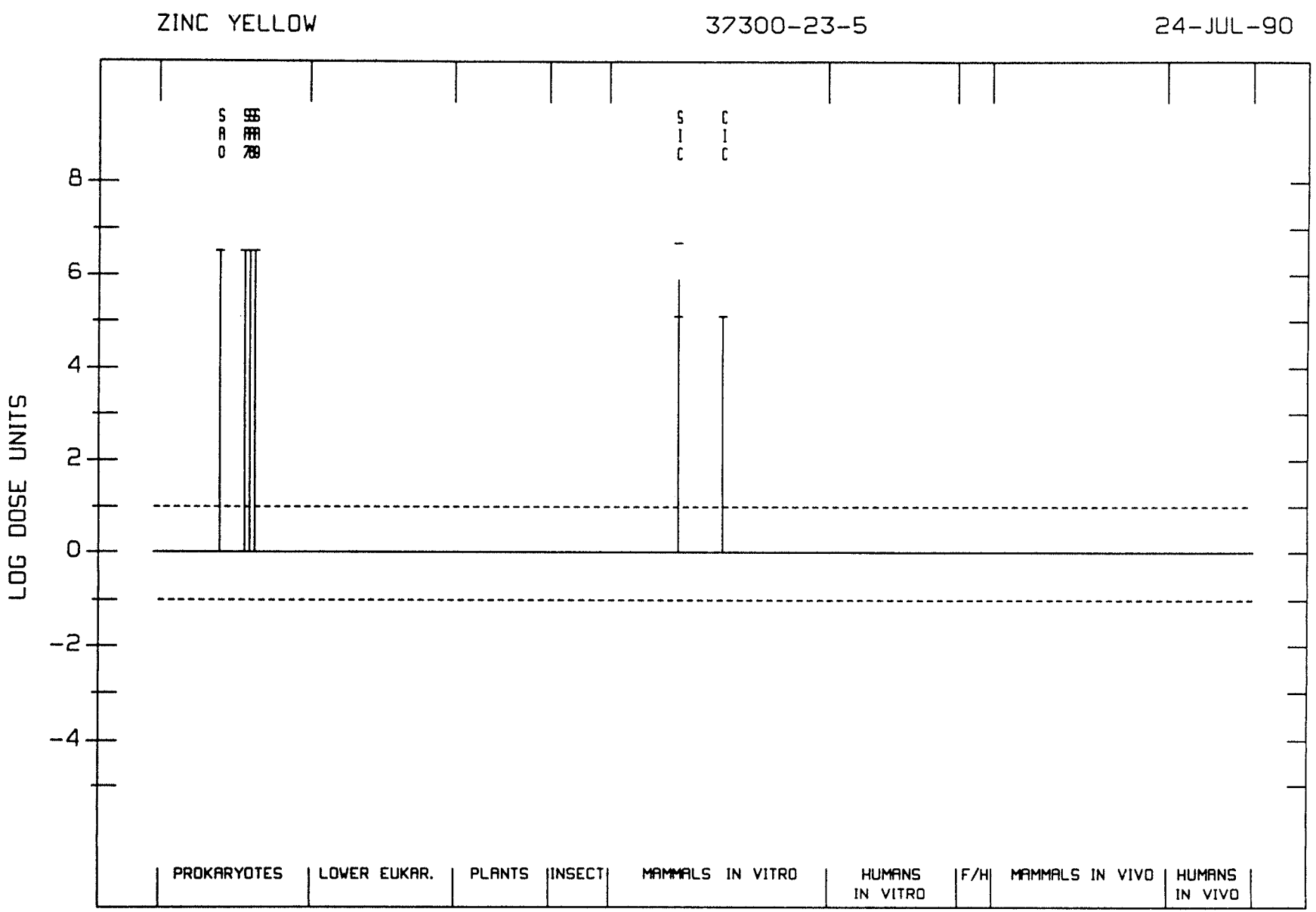
[1]Doses are given as concentrations of the element, not the concentration of the compound.


STRONTIUM CHROMATE
7446-14-2
24-JUL-90
SAO
SIC
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO
8
6
4
2
0
-2
-4
LOG DOSE UNITS

ZINC YELLOW

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	-	0.0000	PETRILLI & DE FLORA, 1978b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.0300	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.0300	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	0.0000	PETRILLI & DE FLORA, 1978b
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	(+)	-	0.0000	PETRILLI & DE FLORA, 1978b
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	+	0	0.0300	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	+	0	0.0300	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	-	0.0000	PETRILLI & DE FLORA, 1978b
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	0	0.0300	DE FLORA, 1981a
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.8000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0200	VENIER ET AL., 1985b
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.8000	LEVIS & MAJONE, 1981

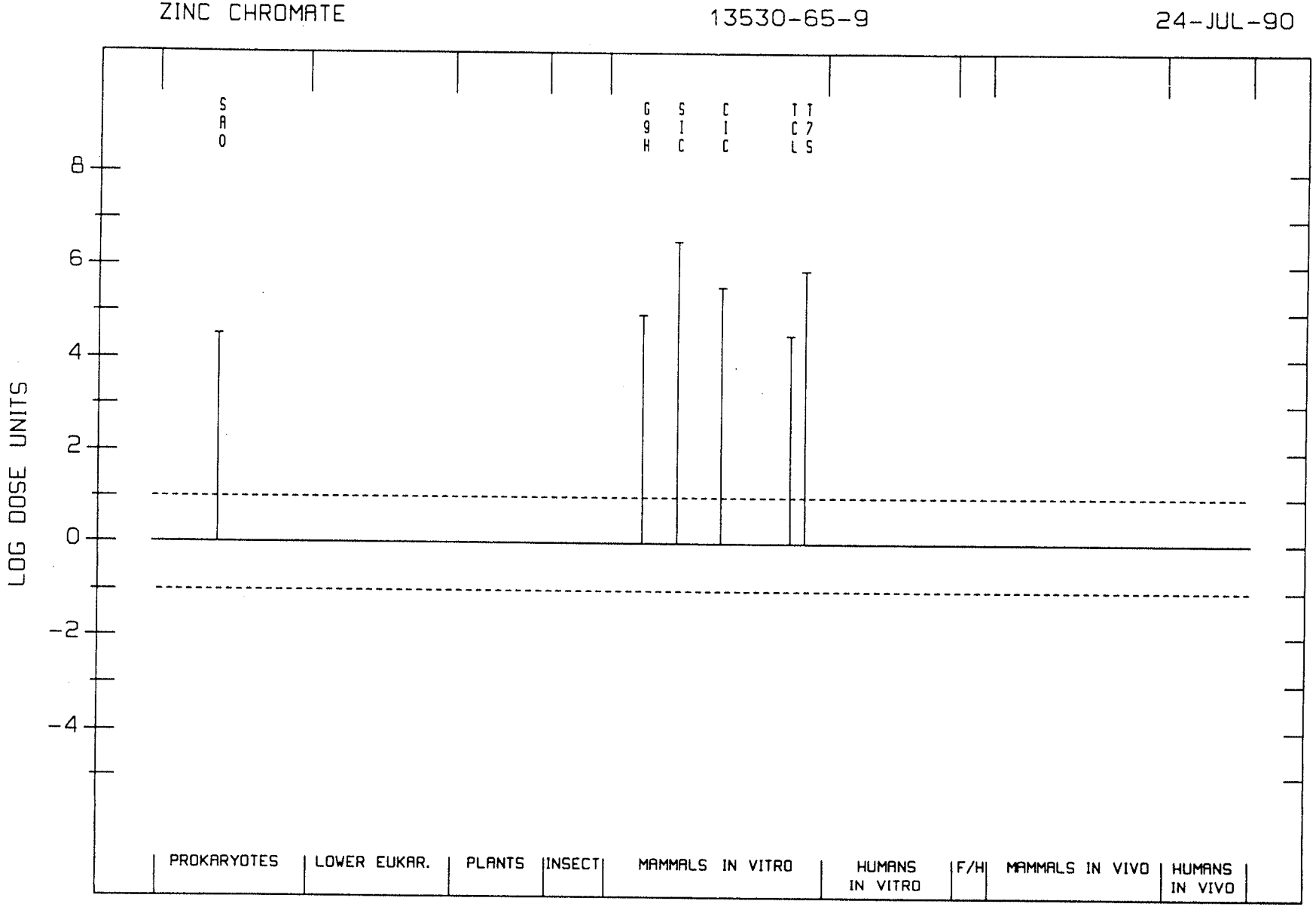
[1]Doses are given as concentrations of the element, not the concentration of the compound.


ZINC YELLOW
37300-23-5
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

ZINC CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	(+)	3.0000	VENIER ET AL., 1985b
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	1.1500	NEWBOLD ET AL., 1979
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0300	VENIER ET AL., 1985b
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0:3000	KOSHI & IWASAKI, 1983
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	3.1000	HANSEN & STERN, 1985
T	T7S	CELL TRANSFORMATION, SA7/SHE CELLS	+	0	0.1300	CASTO ET AL., 1979

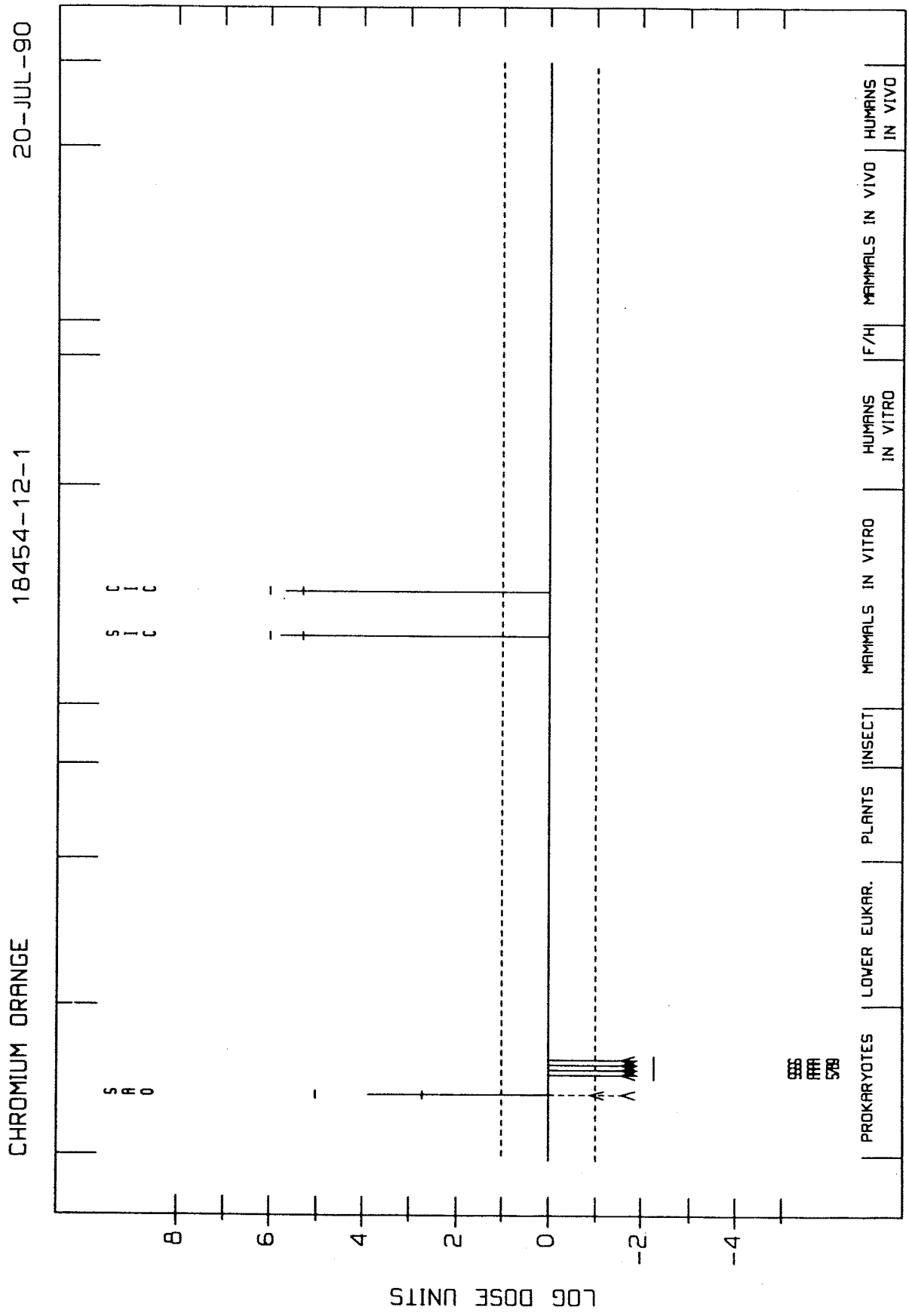
[1]Doses are given as concentrations of the element, not the concentration of the compound.


ZINC CHROMATE
13530-65-9
24-JUL-90
SAO
G9H
SIC
CIC
TCL
T7S
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMIUM ORANGE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	-	0.0000	PETRILLI & DE FLORA, 1978b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	190.0000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	7:6000	VENIER ET AL., 1985b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	+	-	0.9500	VENIER ET AL., 1985b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	38.0000	LOPRIENO ET AL., 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	38.0000	LOPRIENO ET AL., 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	190.0000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	38.0000	LOPRIENO ET AL., 1985
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	190.0000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	38.0000	LOPRIENO ET AL., 1985
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	190.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	38.0000	LOPRIENO ET AL., 1985
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	190.0000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.5000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	0.1000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1000	LOPRIENO ET AL., 1985
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.5000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	0.1000	LEVIS & MAJONE, 1981

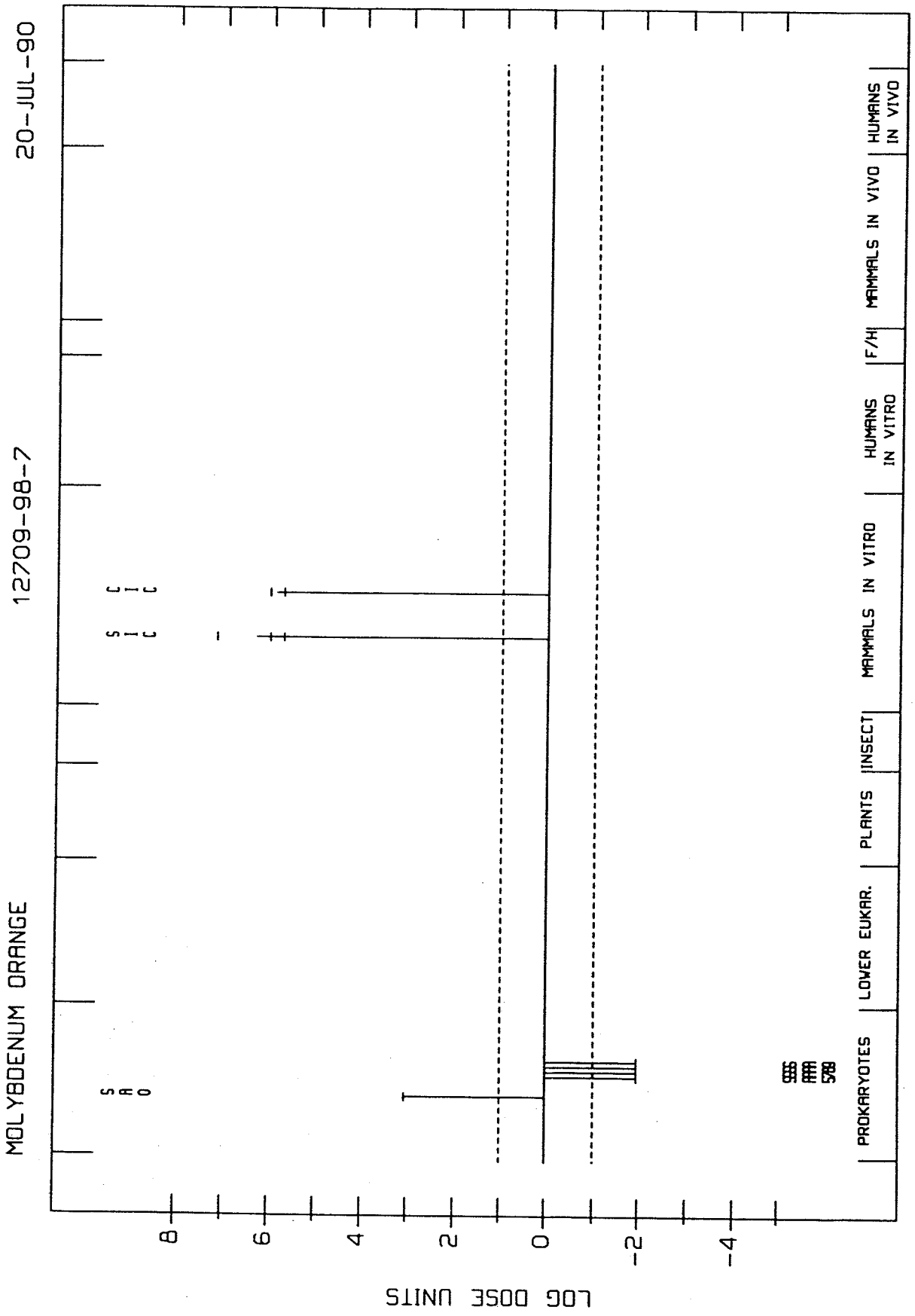
[1]Doses are given as concentrations of the element, not the concentration of the compound.
[2]Dissolved in NaOH


CHROMIUM ORANGE
18454-12-1
20-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO
SAO
SIC
SIC

MOLYBDENUM ORANGE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	90.0000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	90.0000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	90.0000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	90.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	90.0000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.2000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	0.1000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0070	VENIER ET AL., 1985b
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.2000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	0.1000	LEVIS & MAJONE, 1981

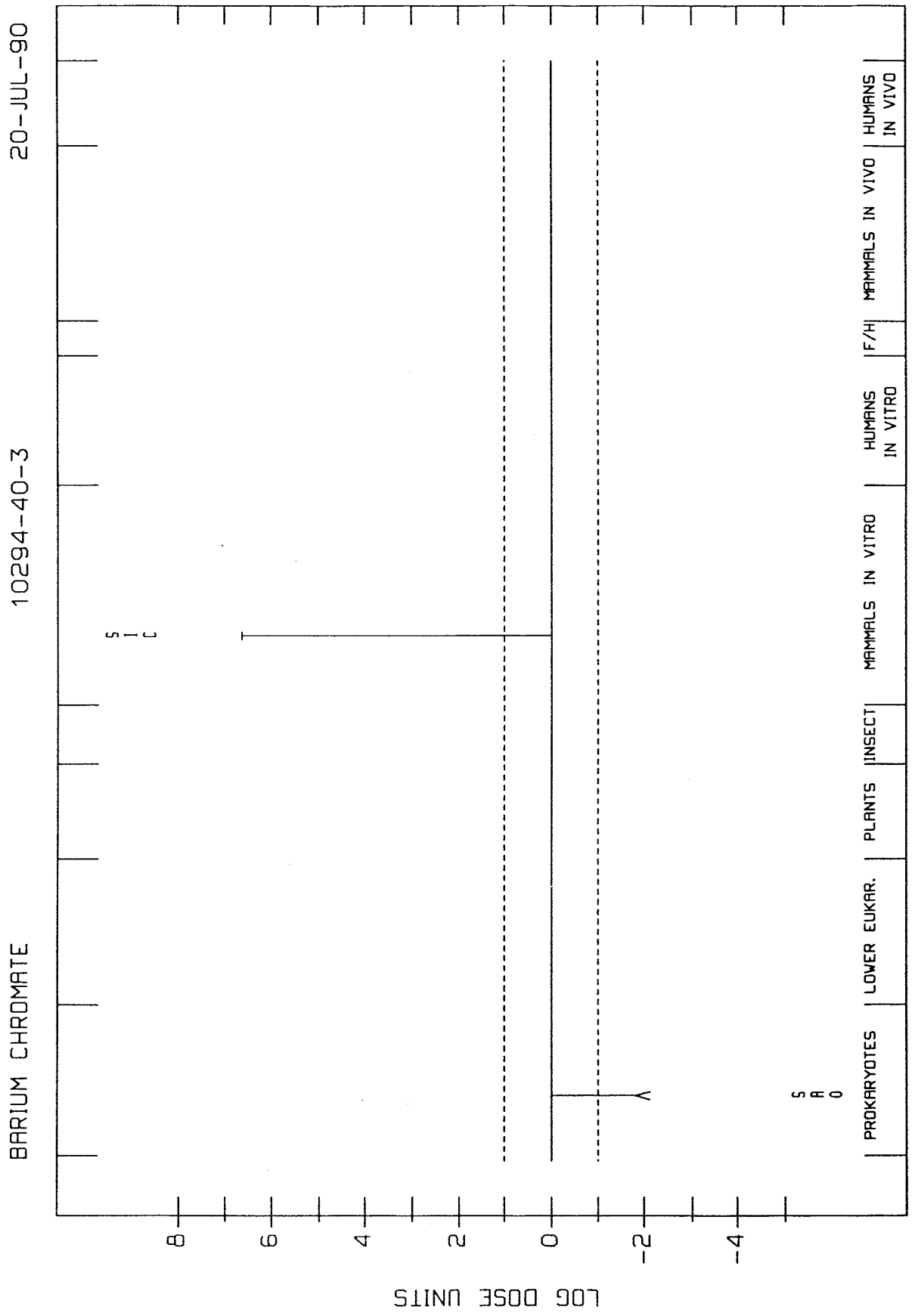
[1]Doses are given as concentrations of the element, not the concentration of the compound.
[2]Dissolved in NaOH


20-JUL-90
12709-98-7
MOLYBDENUM ORANGE
S A O
S I C I C
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO
8
6
4
2
0
-2
-4
LOG DOSE UNITS

BARIUM CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	66.0000	VENIER ET AL., 1985b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	-	-	66.0000	VENIER ET AL., 1985b
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0230	VENIER ET AL., 1985b

[1]Doses are given as concentrations of the element, not the concentration of the compound.
[2]Dissolved in NaOH


BARIUM CHROMATE
10294-40-3
20-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
S
I
C
S
A
O
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

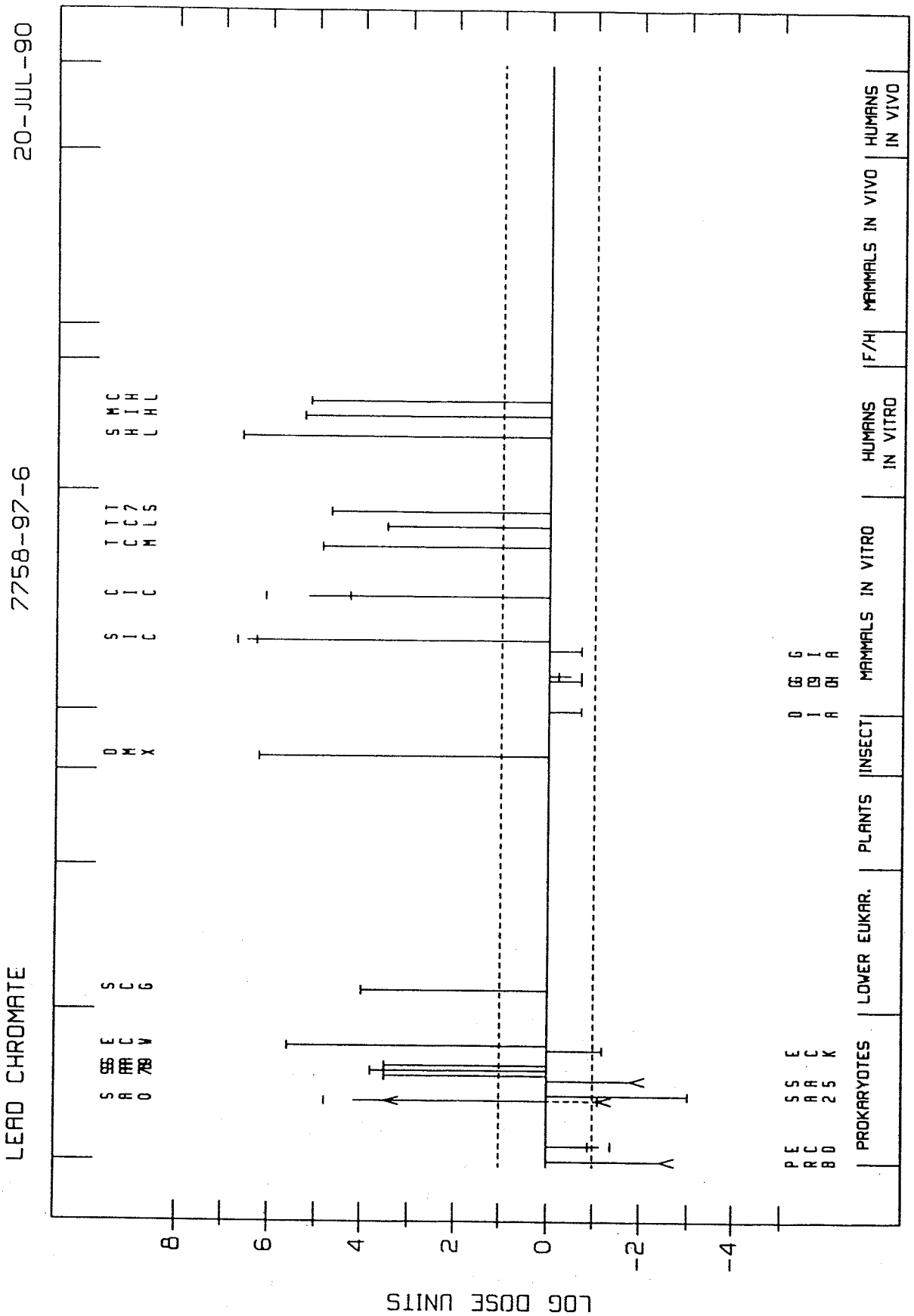
LEAD CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	-	-	275.0000	VENIER ET AL., 1989
D	ECD	E. COLI POL A, DIFFERENTIAL TOX (SPOT)[3]	-	0	25.0000	NESTMANN ET AL., 1979
D	ECD	E. COLI POL A, DIFFERENTIAL TOX (SPOT)	-	0	8.0000	VENIER ET AL., 1987
D	ECL	E. COLI POL A, DIFFERENTIAL TOX (LIQUID)	-	0	0:0000	VENIER ET AL., 1987
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	-	+	32.0000	NESTMANN ET AL., 1979
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	13.0000	LOPRIENO ET AL., 1985
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	13.0000	VENIER ET AL., 1985b
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[3]	+	+	1.6000	VENIER ET AL., 1985b
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	0	1030.0000	DE FLORA ET AL., 1985a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	64.0000	NESTMANN ET AL., 1979
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION[2]	+	+	32.0000	NESTMANN ET AL., 1979
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION[2]	+	+	16.0000	NESTMANN ET AL., 1979
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION[2]	+	+	32.0000	NESTMANN ET AL., 1979
G	ECK	E. COLI K12, FORWARD OR REVERSE MUTATION[3]	-	0	16.0000	NESTMANN ET AL., 1979
G	ECW	E. COLI WP2 UVRA, REVERSE MUTATION[3]	+	0	0.2500	NESTMANN ET AL., 1979
R	SCG	S. CEREVISIAE, GENE CONVERSION[2]	+	(+)	10.0000	NESTMANN ET AL., 1979
G	DMX	D. MELANOGASTER, SEX-LINKED RECESSIVES	-	0	0.0600	COSTA ET AL., 1988
G	DMX	D. MELANOGASTER, SEX-LINKED RECESSIVES[3]	(+)	0	0.0600	COSTA ET AL., 1988
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO[3]	-	0	5.0000	DOUGLAS ET AL., 1980
G	GCO	MUTATION, CHO CELLS IN VITRO	-	0	5.0000	PATIERNO ET AL., 1988
G	G9H	MUTATION, CHL V79 CELLS, HPRT	-	0	1.6000	NEWBOLD ET AL., 1979
G	G9H	MUTATION, CHL V79 CELLS, HPRT	-	0	5.0000	CELOTTI ET AL., 1987
G	GIA	MUTATION, OTHER ANIMAL CELLS IN VITRO	-	0	5.0000	PATIERNO ET AL., 1988
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0200	LOPRIENO ET AL., 1985
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0520	MONTALDI ET AL., 1987b
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	5.2000	MONTALDI ET AL., 1987b
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0800	KOSHI & IWASAKI, 1983
T	TCM	CELL TRANSFORMATION, C3H10T1/2 CELLS	+	0	1.3000	PATIERNO ET AL., 1988
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	32.0000	HANSEN & STERN, 1985

LEAD CHROMATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
T	T7S	CELL TRANSFORMATION, SA7/SHE CELLS	+	0	2.0000	CASTO ET AL., 1979
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO[3]	+	0	0.0250	DOUGLAS ET AL., 1980
M	MIH	MICRONUCLEUS TEST, HUMAN CELLS IN VITRO	+	0	0:5200	MONTALDI ET AL., 1987b
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO[3]	+	0	0.7000	DOUGLAS ET AL., 1980
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	+	0	160.8880	WATANABE ET AL., 1985

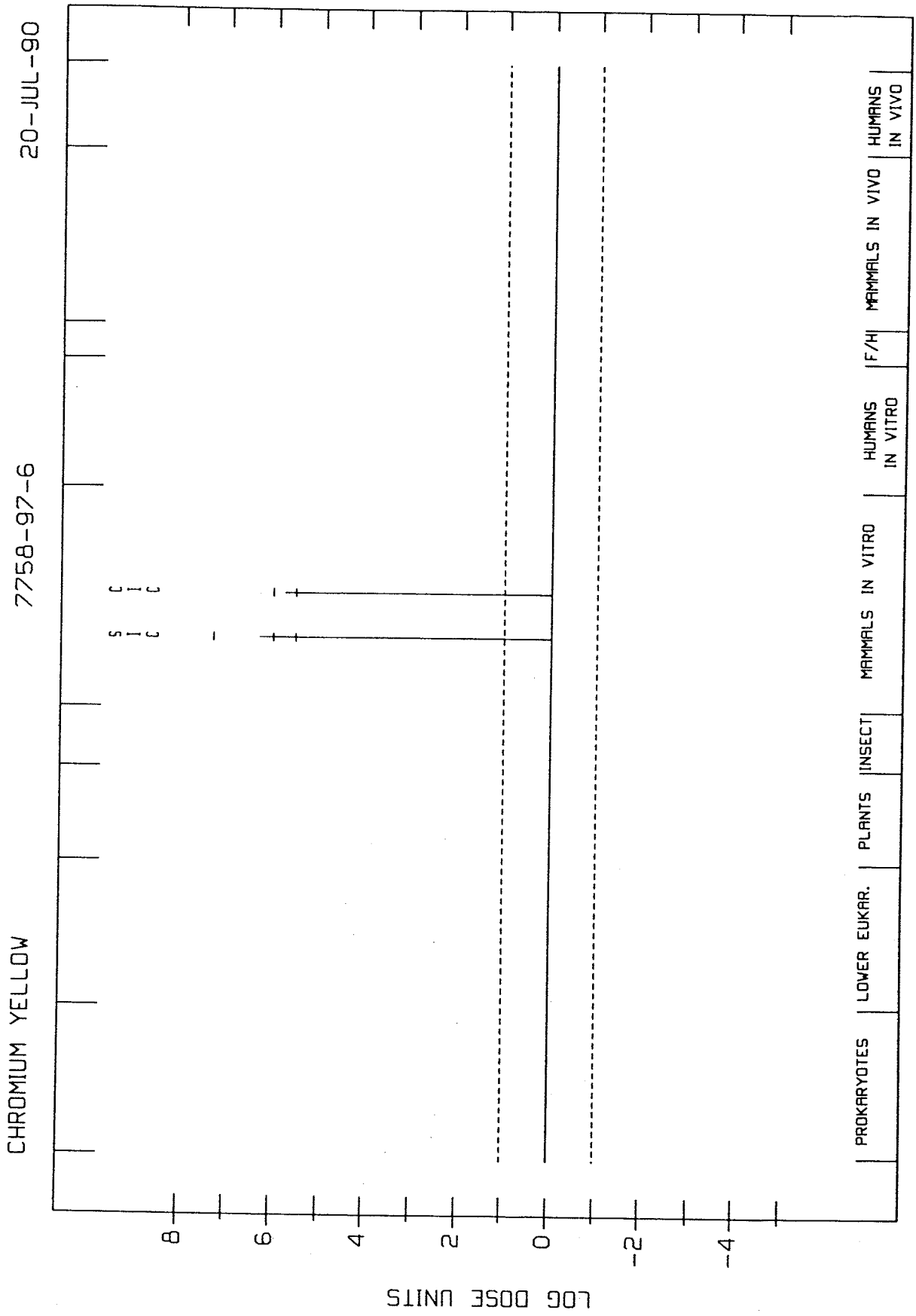
[1]Doses are given as concentrations of the element, not the concentration of the compound.
[2]Dissolved in HCl
[3]Dissolved in NaOH


20-JUL-90
7758-97-6
LEAD CHROMATE
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMIUM YELLOW

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	0.0000	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.0000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION[2]	+	0	0:0000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	0.0000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	0.0000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	0.0000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION[2]	+	0	0.0000	DE FLORA, 1981a
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.3000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	0.1000	LEVIS & MAJONE, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.0050	VENIER ET AL., 1985b
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.3000	LEVIS & MAJONE, 1981
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO[2]	+	0	0.1000	LEVIS & MAJONE, 1981

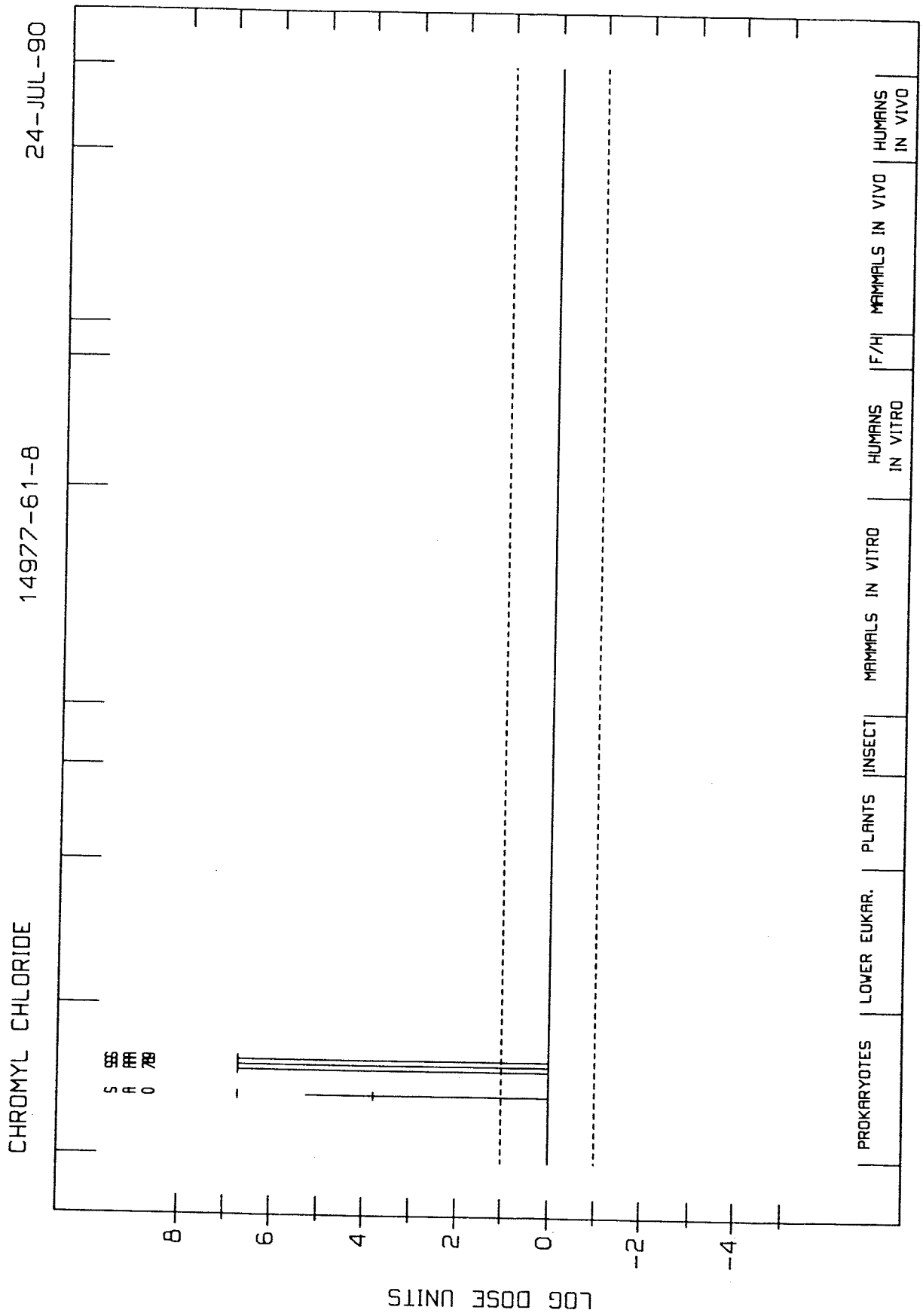
[1]Doses are given as concentrations of the element, not the concentration of the compound.
[2]Dissolved in NaOH


CHROMIUM YELLOW
7758-97-6
20-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMYL CHLORIDE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	0	0.0200	DE FLORA, 1981a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	17.0000	DE FLORA ET AL., 1980
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.0200	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	+	0	0:0200	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	+	0	0.0200	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	0	0.0200	DE FLORA, 1981a

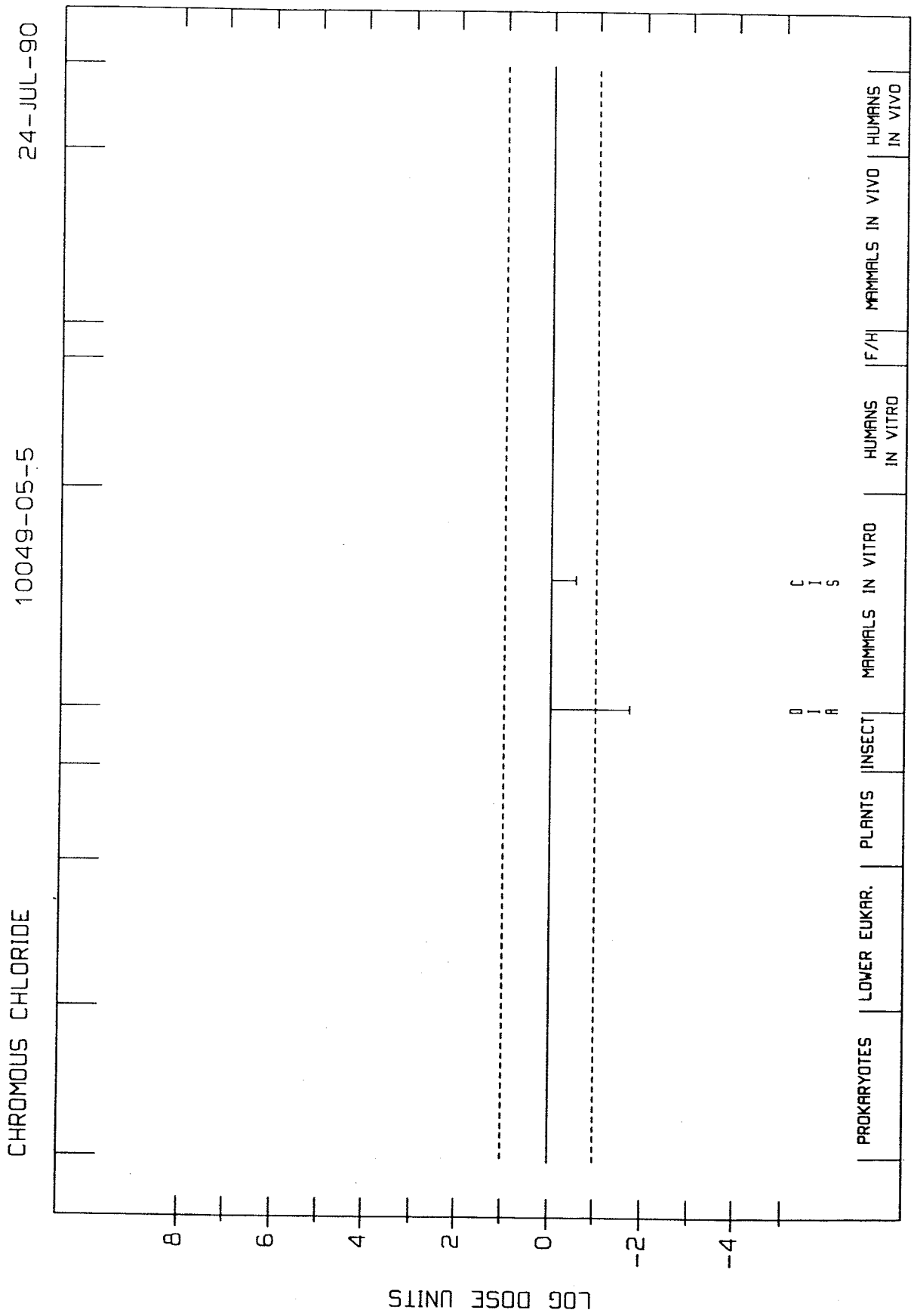
[1]Doses are given as concentrations of the element, not the concentration of the compound.


CHROMYL CHLORIDE
14977-61-8
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

CHROMOUS CHLORIDE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	-	0	52.0000	WEDRYCHOWSKI ET AL., 1986a
C	CIS	CHROM ABERR, SYRIAN HAMSTER CELLS IN VITRO	-	0	3.5000	TSUDA & KATO, 1977
A	AIH	ANEUPLOIDY, HUMAN CELLS IN VITRO	-	0	0.0050	NIJS & KIRSCH-VOLDERS, 1986

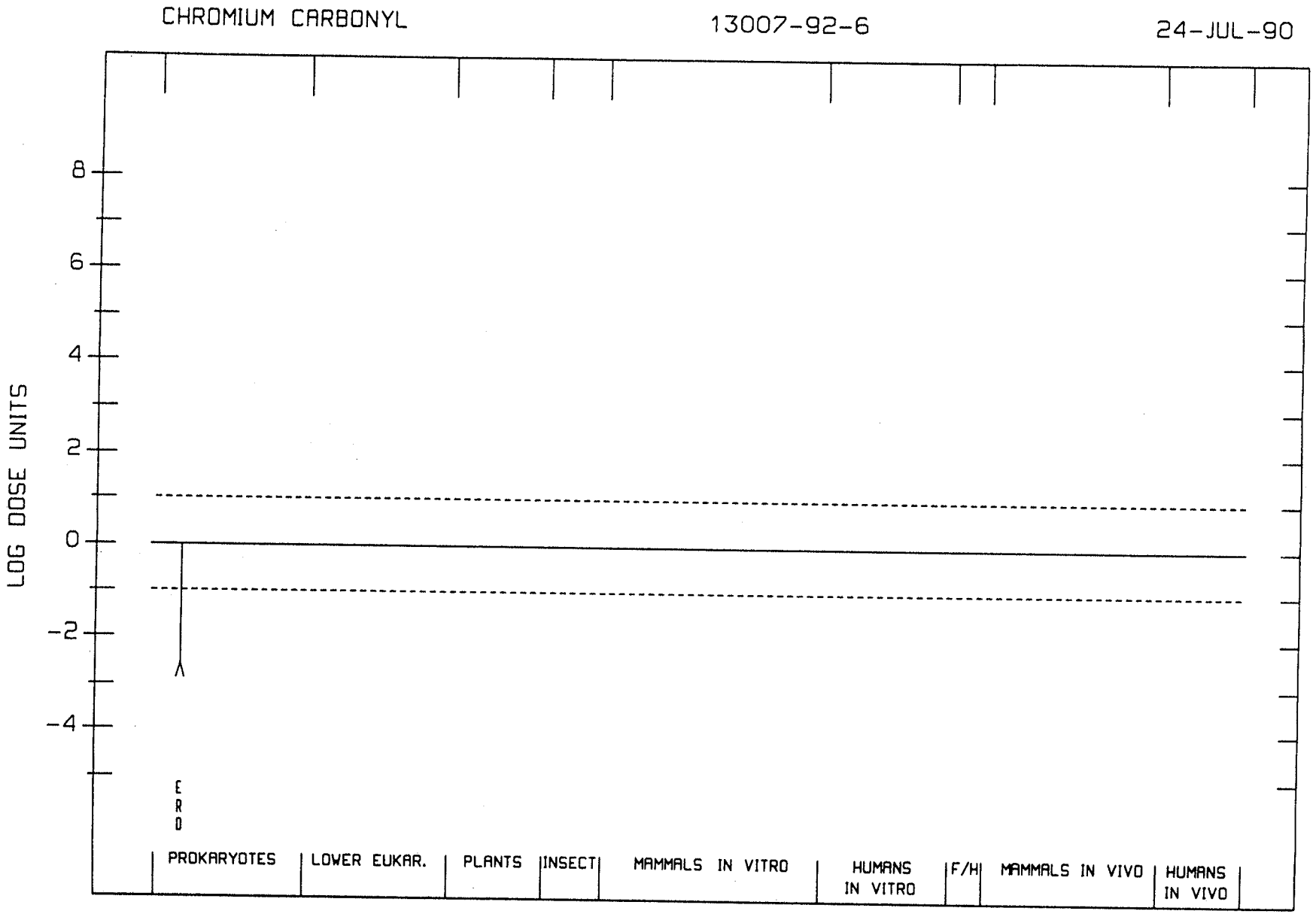
[1]Doses are given as concentrations of the element, not the concentration of the compound.


CHROMOUS CHLORIDE
10049-05-5
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO
D I A
C I S

CHROMIUM CARBONYL

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	-	-	370.0000	DE FLORA ET AL., 1984a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	0.2000	DE FLORA, 1981a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.2000	DE FLORA, 1981a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	0.2000	DE FLORA, 1981a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	0.2000	DE FLORA, 1981a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	0.2000	DE FLORA, 1981a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	0.0000	DE FLORA ET AL., 1984a

[1]Doses are given as concentrations of the element, not the concentration of the compound.


CHROMIUM CARBONYL
13007-92-6
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
ERD
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

NICKEL OCCUPATIONAL EXPOSURE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE (LED OR HID)	REFERENCE
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	-	0	0.1400	WAKSVIK ET AL., 1984[1]
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	-	0	0.0680	WAKSVIK & BOYSEN, 1982[2]
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	-	0	0.0280	WAKSVIK & BOYSEN, 1982[3]
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	(+)	0	0.0140	DENG ET AL., 1983[4]
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	-	0	0.0000	DECHENG ET AL., 1987[5]
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	+	0	0.1400	WAKSVIK ET AL., 1984[1]
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	+	0	0.0680	WAKSVIK & BOYSEN, 1982[2]
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	+	0	0.0280	WAKSVIK & BOYSEN, 1982[3]
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	+	0	0.0140	DENG ET AL., 1983[4]
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	-	0	0.0000	DECHENG ET AL., 1987[5]

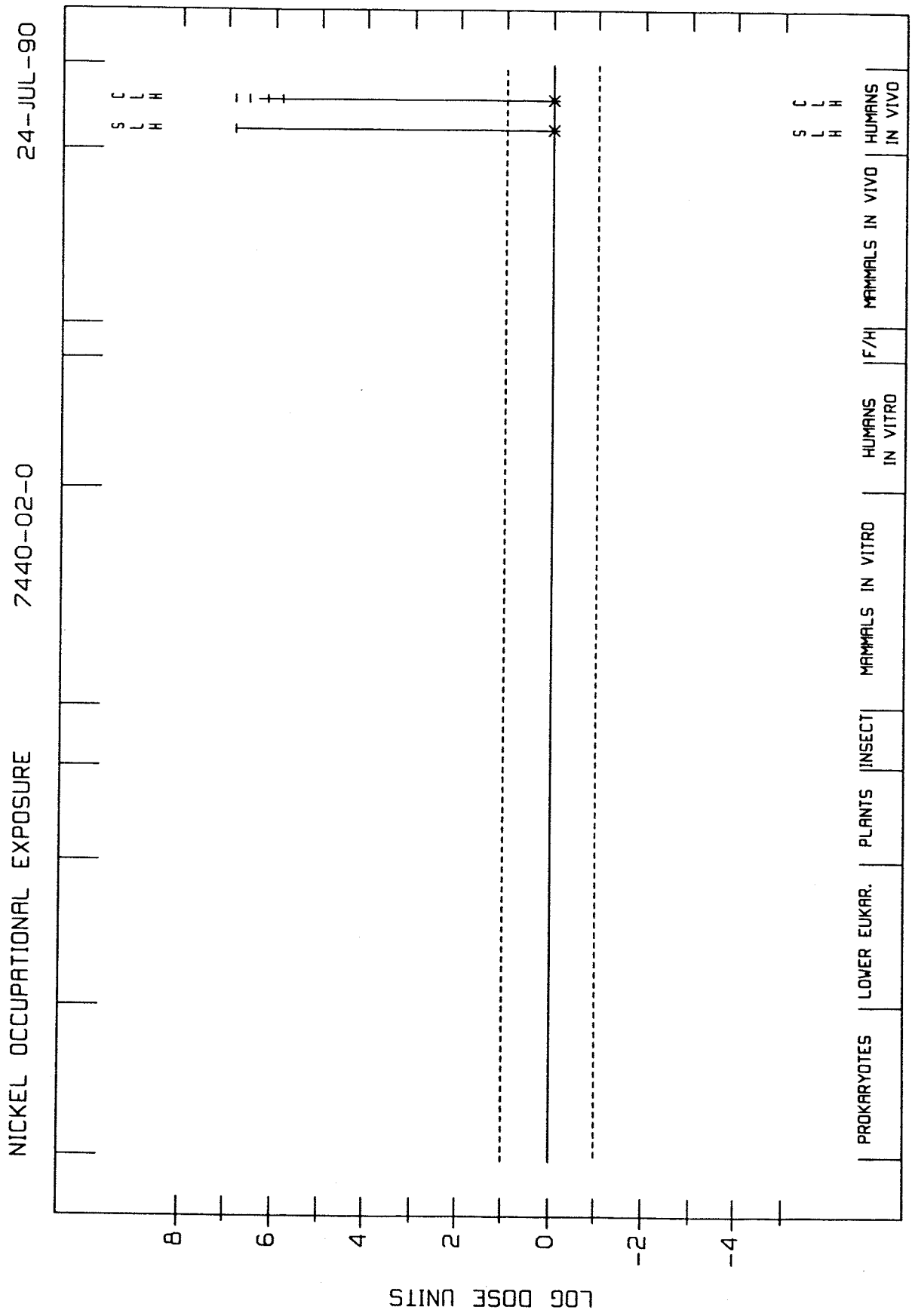
[1] NiO and $Ni_3S_2/NiCl_2$, $NiSO_4$ (crushing, roasting, smelting and/or electrolysis)

[2] NiO and Ni_3S_2 (crushing, roasting, smelting)

[3] $NiCl_2$ and $NiSO_4$ (electrolysis)

[4] Ni and chromium (electroplating)

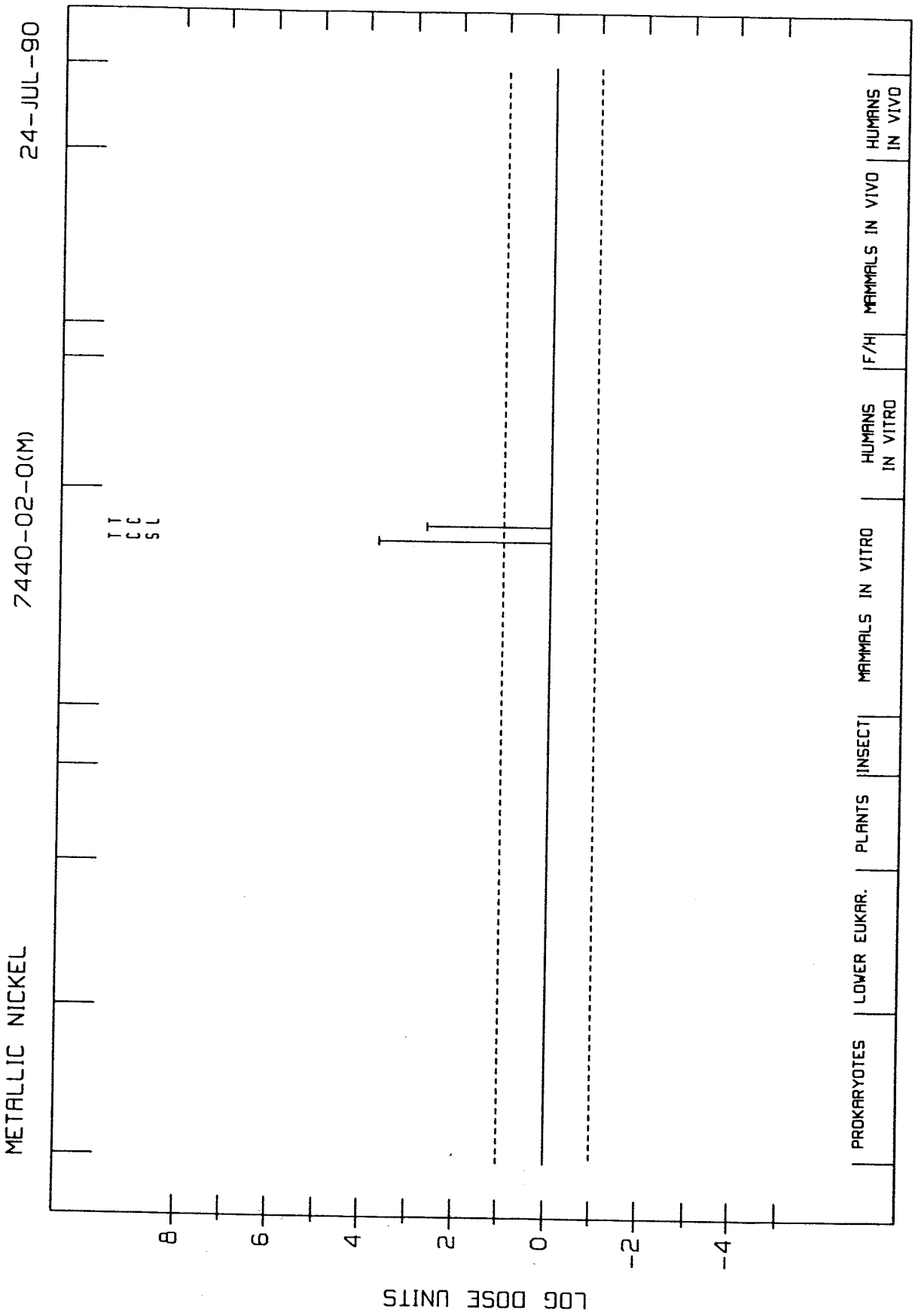
[5] $Ni(CO)_4$ (production of nickel carbonyl)


NICKEL OCCUPATIONAL EXPOSURE
7440-02-0
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
S C
L L
H H
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

METALLIC NICKEL

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	20.0000	COSTA ET AL., 1981b
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	200.0000	HANSEN & STERN, 1984
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	-	0	0.0000	PATON & ALLISON, 1972

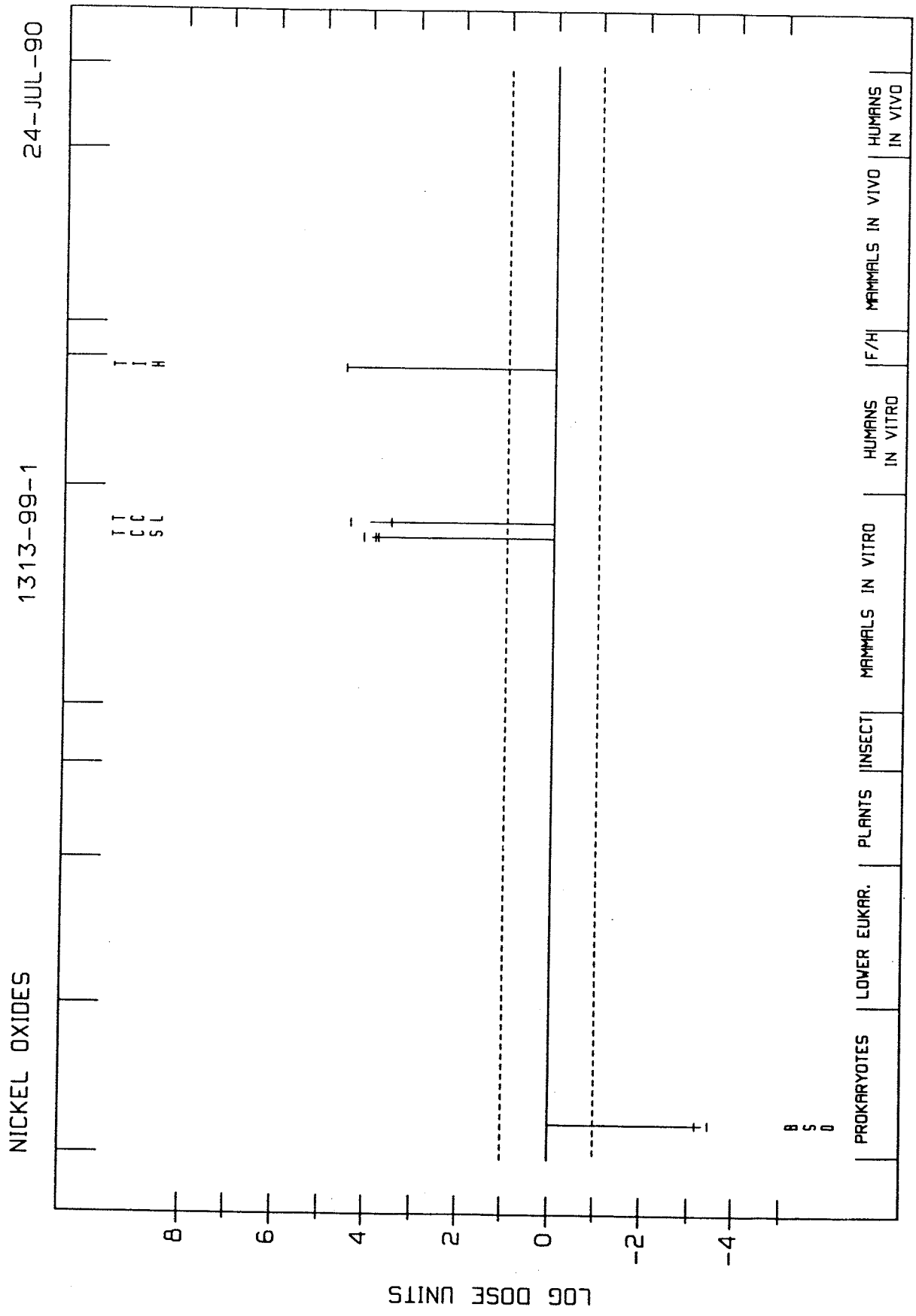
[1]Doses are given as concentrations of the element, not the concentration of the compound.


METALLIC NICKEL
7440-02-0(M)
24-JUL-90
T
C
S
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

NICKEL OXIDES

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY[2]	-	0	1475.0000	KANEMATSU ET AL., 1980
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY[3]	-	0	2950.0000	KANEMATSU ET AL., 1980
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY[2]	+	0	16.0000	COSTA ET AL., 1981b
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY[3]	+	0	14.0000	COSTA ET AL., 1981b
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY[3]	+	0	7.9000	SUNDERMAN ET AL., 1987
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES[2]	+	0	30.0000	HANSEN & STERN, 1983
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES[3]	+	0	4.0000	HANSEN & STERN, 1983
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO[3]	-	0	0.0000	PATON & ALLISON, 1972
T	TIH	CELL TRANSFORMATION, HUMAN CELLS IN VITRO[3]	+	0	3.0000	BIEDERMANN & LANDOLPH, 1987

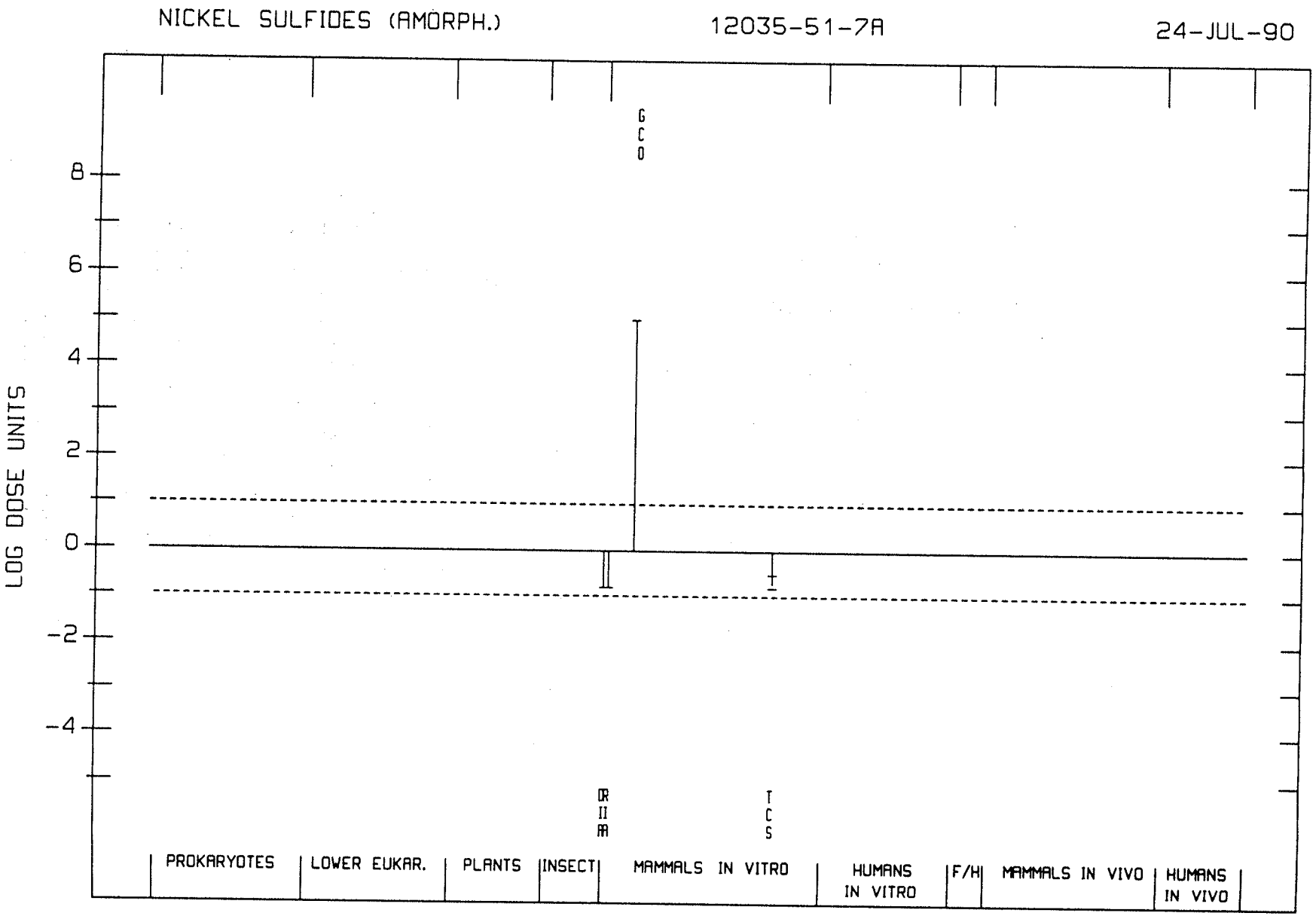
[1]Doses are given as concentrations of the element, not the concentration of the compound.
[2]Nickel trioxide
[3]Nickel monoxide


NICKEL OXIDES
1313-99-1
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

NICKEL SULFIDES (AMORPH.)

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	-	0	6.5000	COSTA ET AL., 1982
D	RIA	OTHER DNA REPAIR, ANIMAL CELLS IN VITRO	-	0	6.5000	ROBISON ET AL., 1983
G	GCO	MUTATION, CHO CELLS IN VITRO	(+)	0	1.0000	COSTA ET AL., 1980
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	-	0	3.2500	COSTA ET AL., 1979
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	-	0	6.5000	COSTA & MOLLENHAUER, 1980a
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	-	0	6.5000	COSTA ET AL., 1982

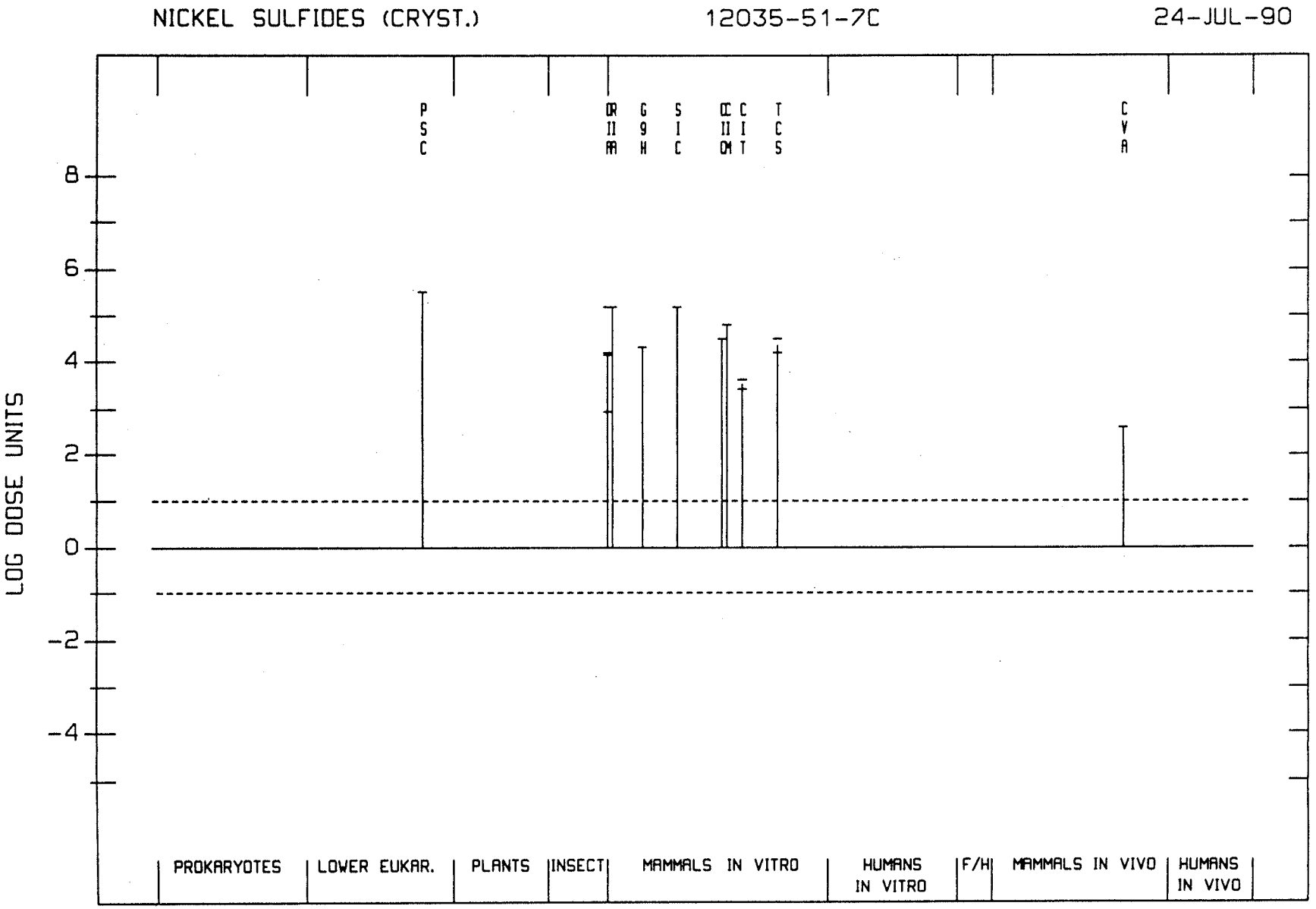
[1]Doses are given as concentrations of the element, not the concentration of the compound.


NICKEL SULFIDES (AMORPH.)
12035-51-7A
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
GCO
DRIIAA
TCS
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

NICKEL SULFIDES (CRYST.)

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
C	PSC	PARAMECIUM SPECIES, CHROM ABERR	+	0	0.3000	SMITH-SONNEBORN ET AL., 1983
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	(+)	0	114.0000	SINA ET AL., 1983
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	6.5000	COSTA ET AL., 1982
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	0:6500	ROBISON & COSTA, 1982
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	6.5000	PATIERNO & COSTA, 1985
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	7.3000	ROBINSON ET AL., 1982
D	RIA	OTHER DNA REPAIR, ANIMAL CELLS IN VITRO	+	0	0.6500	ROBISON ET AL., 1983
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	4.9000	CHRISTIE ET AL., 1990
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.6500	SEN & COSTA, 1986
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	3.2000	SEN & COSTA, 1985
C	CIM	CHROM ABERR, MOUSE CELLS IN VITRO	+	0	1.6000	SEN ET AL., 1987
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	+	0	38.0000	UMEDA & NISHIMURA, 1979
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	+	0	24.0000	NISHIMURA & UMEDA, 1979
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	6.5000	COSTA ET AL., 1982
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	3.2500	COSTA & MOLLENHAUER, 1980c
C	CVA	CHROM ABERR, OTHER ANIMAL CELLS IN VIVO	+	0	250.0000	CHRISTIE ET AL., 1988

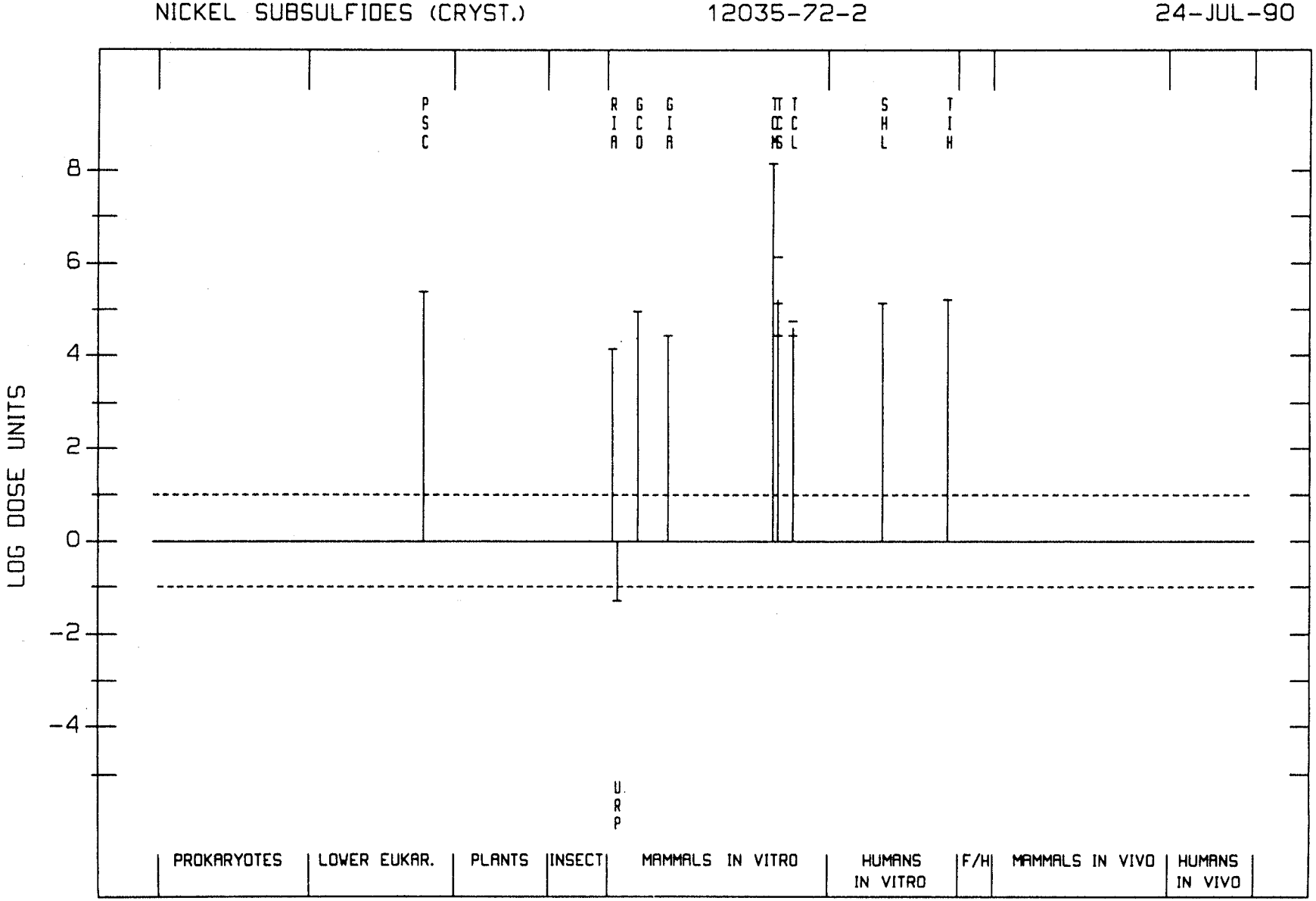
[1]Doses are given as concentrations of the element, not the contration of the compound.


NICKEL SULFIDES (CRYST.)
12035-51-7C
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PSC
ORH
G9H
SIC
CIT
TCS
CVA
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

NICKEL SUBSULFIDES

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
C	PSC	PARAMECIUM SPECIES, CHROM ABERR	+	0	0.4000	SMITH-SONNEBORN ET AL., 1983
D	RIA	OTHER DNA REPAIR, ANIMAL CELLS IN VITRO	+	0	7.3000	ROBISON ET AL., 1983
D	URP	UDS, RAT PRIMARY HEPATOCYTES	–	0	20.0000	SWIERENGA & MCLEAN, 1985
G	GCO	MUTATION, CHO CELLS IN VITRO	(+)	0	1.1000	COSTA ET AL., 1980
G	GIA	MUTATION, OTHER ANIMAL CELLS IN VITRO	+	0	3.7000	SWIERENGA & MCLEAN, 1985
T	TCM	CELL TRANSFORMATION, C3H10T1/2 CELLS	+	0	0.0007	SAXHOLM ET AL., 1981
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	0.7300	DIPAOLO & CASTO, 1979
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	0.0730	COSTA ET AL., 1979
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	0.7300	COSTA & MOLLENHAUER, 1980a
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	3.7000	COSTA & MOLLENHAUER, 1980c
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	3.7000	HANSEN & STERN, 1983
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	1.8000	SWIERENGA ET AL., 1989
G	GIH	MUTATION, HUMAN CELLS IN VITRO	–	0	0.6000	BIEDERMANN & LANDOLPH, 1987
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.7300	SAXHOLM ET AL., 1981
T	TIH	CELL TRANSFORMATION, HUMAN CELLS IN VITRO	+	0	0.6000	BIEDERMANN & LANDOLPH, 1987

[1]Doses are given as concentrations of the element, not the concentration of the compound.


NICKEL SUBSULFIDES (CRYST.)
12035-72-2
24-JUL-90
LOG DOSE UNITS
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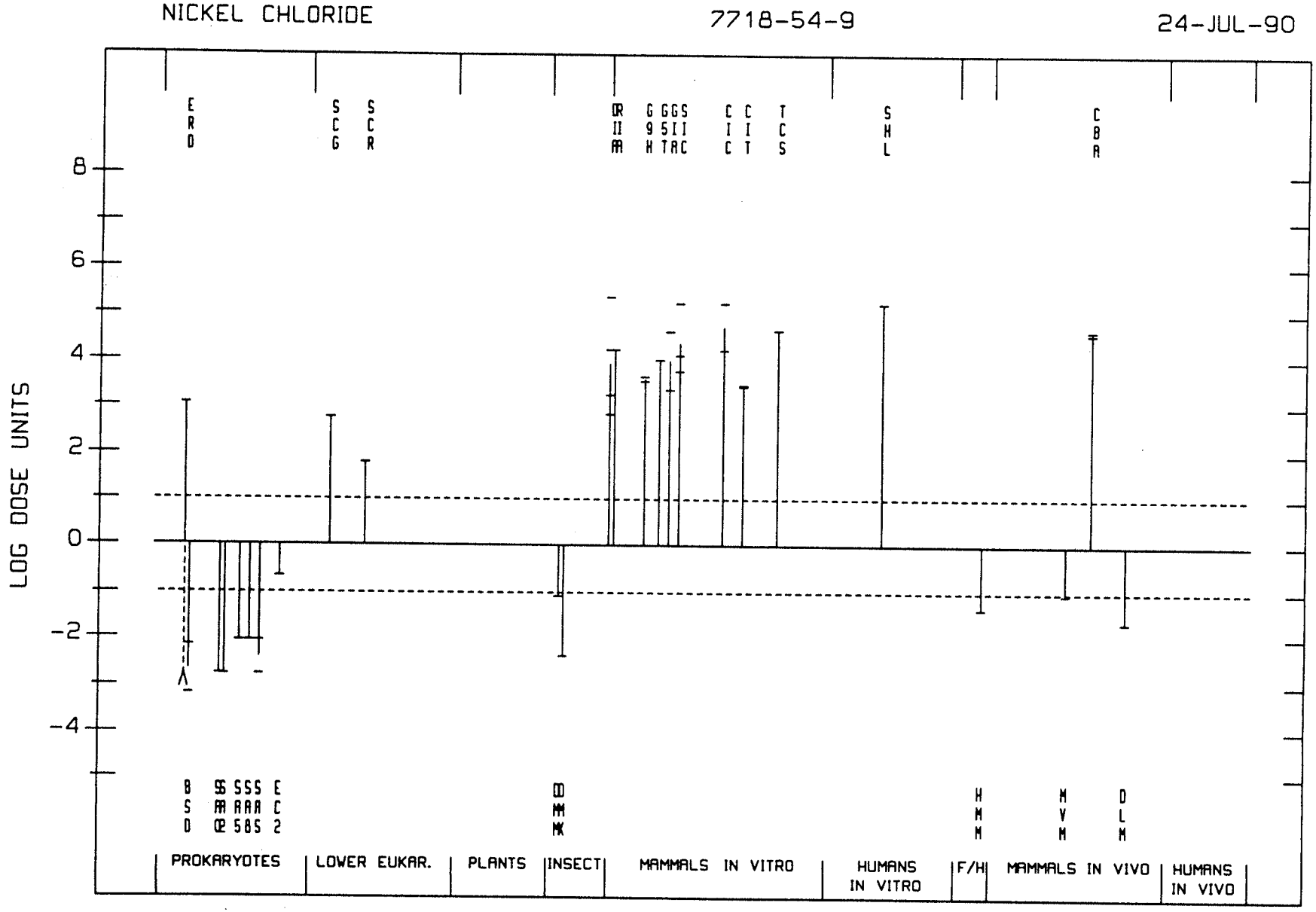
6
4
2
0
-2
-4
PSC
RIA
GCO
GIR
TCL
SHL
TIH
URP
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	-	-	567.0000	DE FLORA ET AL., 1984a
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	+	0	90.0000	TWEATS ET AL., 1981
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	-	0	0.0100	DUBINS & LA VELLE, 1986
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	1475.0000	KANEMATSU ET AL., 1980
D	BSD	B. SUBTILIS REC, DIFFERENTIAL TOXICITY	-	0	147.5000	NISHIOKA, 1975
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	587.0000	TSO & FUNG, 1981
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	0	590.0000	BIGGART & COSTA, 1986
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	118.0000	BIGGART & COSTA, 1986
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	118.0000	BIGGART & COSTA, 1986
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	590.0000	TSO & FUNG, 1981
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	0	118.0000	BIGGART & COSTA, 1986
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	EC2	E. COLI WP2, REVERSE MUTATION	-	0	4.5000	GREEN ET AL., 1976
R	SCG	S. CEREVISIAE, GENE CONVERSION	+	0	176.0000	FUKUNAGA ET AL., 1982
G	SCR	S. CEREVISIAE, REVERSE MUTATION	+	0	1535.0000	EGILSSON ET AL., 1979
G	DMM	D. MELANOGASTER, SOMATIC MUTAT/RECOMB	-	0	12.0000	RASMUSON, 1985
G	DMX	D. MELANOGASTER, SEX-LINKED RECESSIVES	-	0	248.0000	VOGEL, 1976
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	0.4500	ROBISON & COSTA, 1982
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	150.0000	PATIERNO & COSTA, 1985
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	5.9000	ROBISON ET AL., 1982
D	DIA	STRAND BREAKS/X-LINKS, ANIMAL CELLS IN VITRO	+	0	59.0000	ROBISON ET AL., 1984
D	RIA	OTHER DNA REPAIR, ANIMAL CELLS IN VITRO	+	0	5.9000	ROBISON ET AL., 1983
G	GCO	MUTATION, CHO CELLS IN VITRO	(+)	0	0.0000	HSIE ET AL., 1979
G	G9H	MUTATION, CHL V79 CELLS, HPRT	(+)	0	23.0000	MIYAKI ET AL., 1979
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	29.5000	HARTWIG & BEYERSMANN, 1989

NICKEL CHLORIDE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	G5T	MUTATION, L5178Y CELLS, TK LOCUS	+	0	10.0000	AMACHER & PAILLET, 1980
G	GIA	MUTATION, OTHER ANIMAL CELLS IN VITRO	+	0	2.4000	BIGGART & MURPHY, 1988
G	GIA	MUTATION, OTHER ANIMAL CELLS IN VITRO	+	0	45.0000	SWIERENGA & MCLEAN, 1985
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	8.0000	OHNO ET AL., 1982
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.6000	SEN & COSTA, 1986
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	17.7000	HARTWIG & BEYERSMANN, 1989
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.6000	SEN & COSTA, 1985
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	6.0000	SEN ET AL., 1987
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	(+)	0	38.0000	UMEDA & NISHIMURA, 1979
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	+	0	35.0000	NISHIMURA & UMEDA, 1979
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	2.2500	ZHANG & BARRETT, 1988
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	?	0	3.0000	MCLEAN ET AL., 1982
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.6000	NEWMAN ET AL., 1982
H	HMM	HOST-MEDIATED ASSAY, MICROBIAL CELLS	-	0	23.0000	BUSELMAIER ET AL., 1972
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	-	0	11.000	DEKNUDT & LEONARD, 1982
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	+	0	2.3000	CHORVATOVICOVA, 1983
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	+	0	2.7000	MOHARTY, 1987
C	DLM	DOMINANT LETHAL TEST, MICE	-	0	46.0000	DEKNUDT & LEONARD, 1982

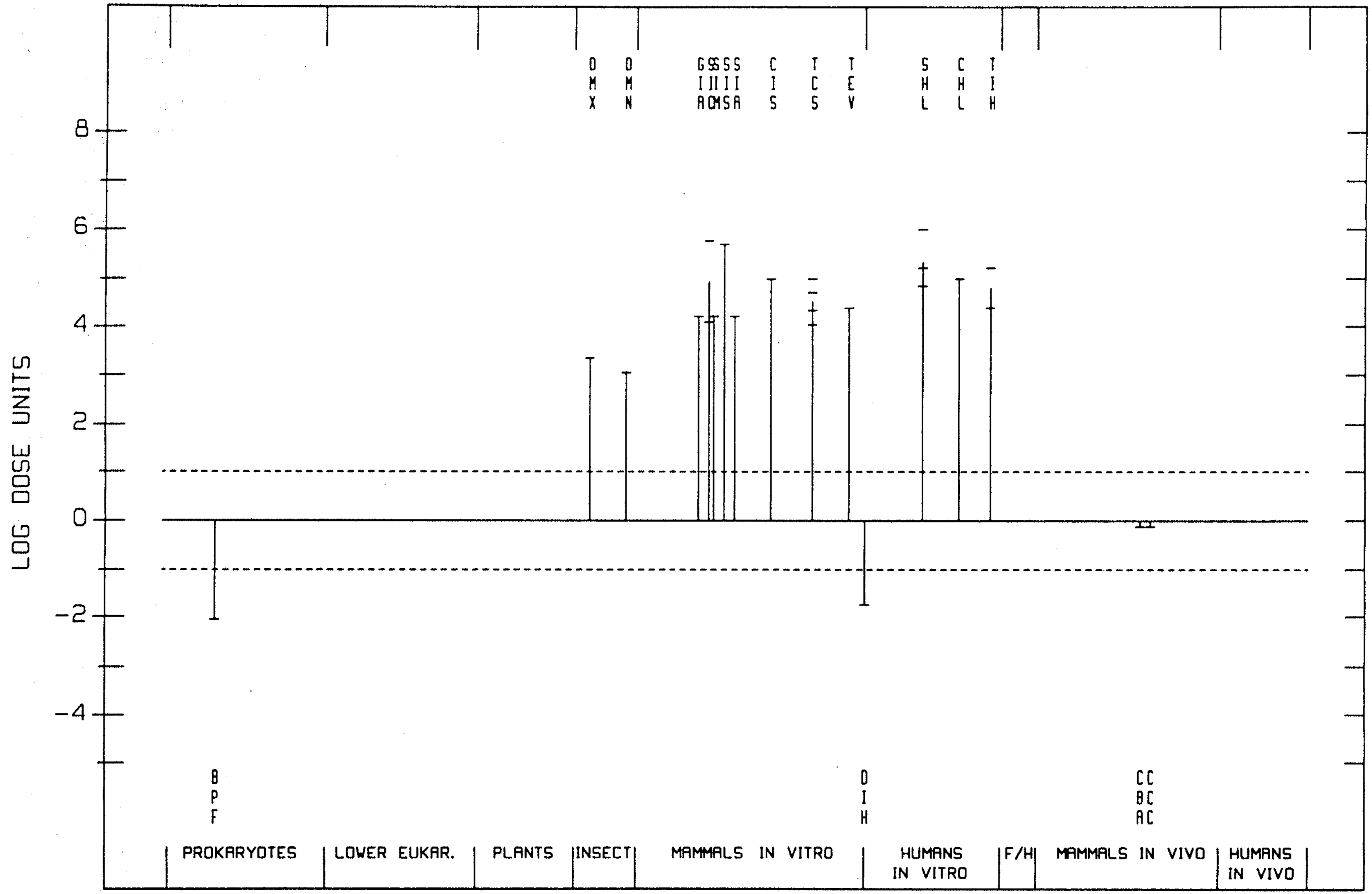
[1]Doses are given as concentrations of the element, not the concentration of the compound.


NICKEL CHLORIDE
7718-54-9
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	BPF	BACTERIOPHAGE, FORWARD MUTATION	-	0	114.0000	CORBETT ET AL., 1970
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	0	0:0000	ARLAUSKAS ET AL., 1985
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	EC2	E. COLI WP2, REVERSE MUTATION	-	0	0.0000	ARLAUSKAS ET AL., 1985
G	DMX	D. MELANOGASTER, SEX-LINKED RECESSIVES	+	0	45.0000	RODRIGUEZ-ARNAIZ & RAMOS, 1986
A	DMN	D. MELANOGASTER, ANEUPLOIDY	(+)	0	90.0000	RODRIGUEZ-ARNAIZ & RAMOS, 1986
G	GIA	MUTATION, OTHER ANIMAL CELLS IN VITRO	-	0	1.0000	RIVEDAL & SANNER, 1980
G	GIA	MUTATION, OTHER ANIMAL CELLS IN VITRO	(+)	0	6.0000	CHRISTIE ET AL., 1990
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.1700	DENG & QU, 1981
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	8.0000	OHNO ET AL., 1982
S	SIM	SCE, MOUSE CELLS IN VITRO	+	0	6.0000	ANDERSEN, 1983
S	SIS	SCE, SYRIAN HAMSTER CELLS IN VITRO	+	0	0.2000	LARRAMENDY ET AL., 1981
S	SIA	SCE, OTHER ANIMAL CELLS IN VITRO	(+)	0	6.0000	ANDERSEN, 1983
C	CIS	CHROM ABERR, SYRIAN HAMSTER CELLS IN VITRO	+	0	1.0000	LARRAMENDY ET AL., 1981
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	4.5000	RIVEDAL & SANNER, 1980
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	9.0000	PIENTA ET AL., 1977
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	1.0000	DIPAOLO & CASTO, 1979
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	1.9000	ZHANG & BARRETT, 1988
T	TEV	CELL TRANSFORMATION, OTHER VIRAL SYSTEMS	+	0	4.0000	WILSON & KHOOBYARIAN, 1982
D	DIH	STRAND BREAKS/X-LINKS, HUMAN CELLS IN VITRO	-	0	56.0000	FORNACE, 1982
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	1.4000	WULF, 1980
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.6000	LARRAMENDY ET AL., 1981
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.1000	DENG & QU, 1981
S	SHL	SCE, HUMAN LYMPHOCYTES IN VITRO	+	0	0.6000	ANDERSEN, 1983
C	CHL	CHROM ABERR, HUMAN LYMPHOCYTES IN VITRO	+	0	1.0000	LARRAMENDY ET AL., 1981
T	TIH	CELL TRANSFORMATION, HUMAN CELLS IN VITRO	+	0	4.0000	LECHNER ET AL., 1984
T	TIH	CELL TRANSFORMATION, HUMAN CELLS IN VITRO	+	0	0.6000	BIEDERMANN & LANDOLPH, 1987
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	-	0	1.3000	MATHUR ET AL., 1978
C	CCC	CHROM ABERR, SPERMATOCYTES	-	0	1.3000	MATHUR ET AL., 1978
I	ICR	INHIBIT CELL COMMUNICATION, ANIMAL CELLS	+	0	60.0000	MIKI ET AL., 1987

[1]Doses are given as concentrations of the element, not the concentration of the compound.

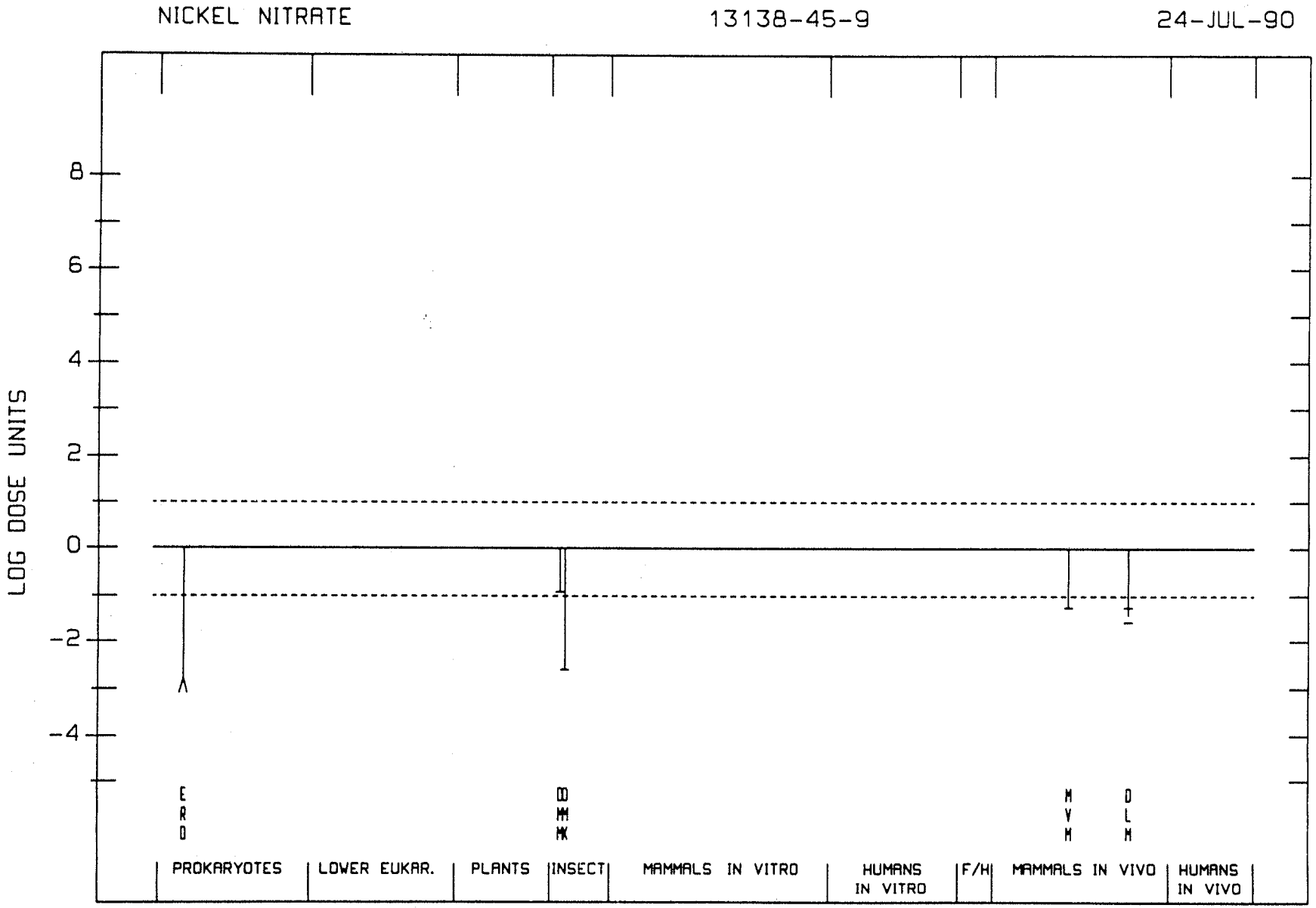
NICKEL SULFATE 7786-81-4 24-JUL-90



NICKEL NITRATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	-	-	605.0000	DE FLORA ET AL., 1984a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	DMM	D. MELANOGASTER, SOMATIC MUTAT/RECOMB	-	0	8.2500	RASMUSON, 1985
G	DMX	D. MELANOGASTER, SEX-LINKED RECESSIVES	-	0	8.2500	RASMUSON, 1985
G	DMX	D. MELANOGASTER, SEX-LINKED RECESSIVES	-	0	407.0000	VOGEL, 1976
M	MVM	MICRONUCLEUS TEST, MICE IN VIVO	-	0	18.0000	DEKNUDT & LEONARD, 1982
C	DLM	DOMINANT LETHAL TEST, MICE	-	0	37.0000	DEKNUDT & LEONARD, 1982
C	DLM	DOMINANT LETHAL TEST, MICE	-	0	18.0000	JAQUET & MAYENCE, 1982

[1]Doses are given as concentrations of the element, not the concentration of the compound.


NICKEL NITRATE
13138-45-9
24-JUL-90
LOG DOSE UNITS
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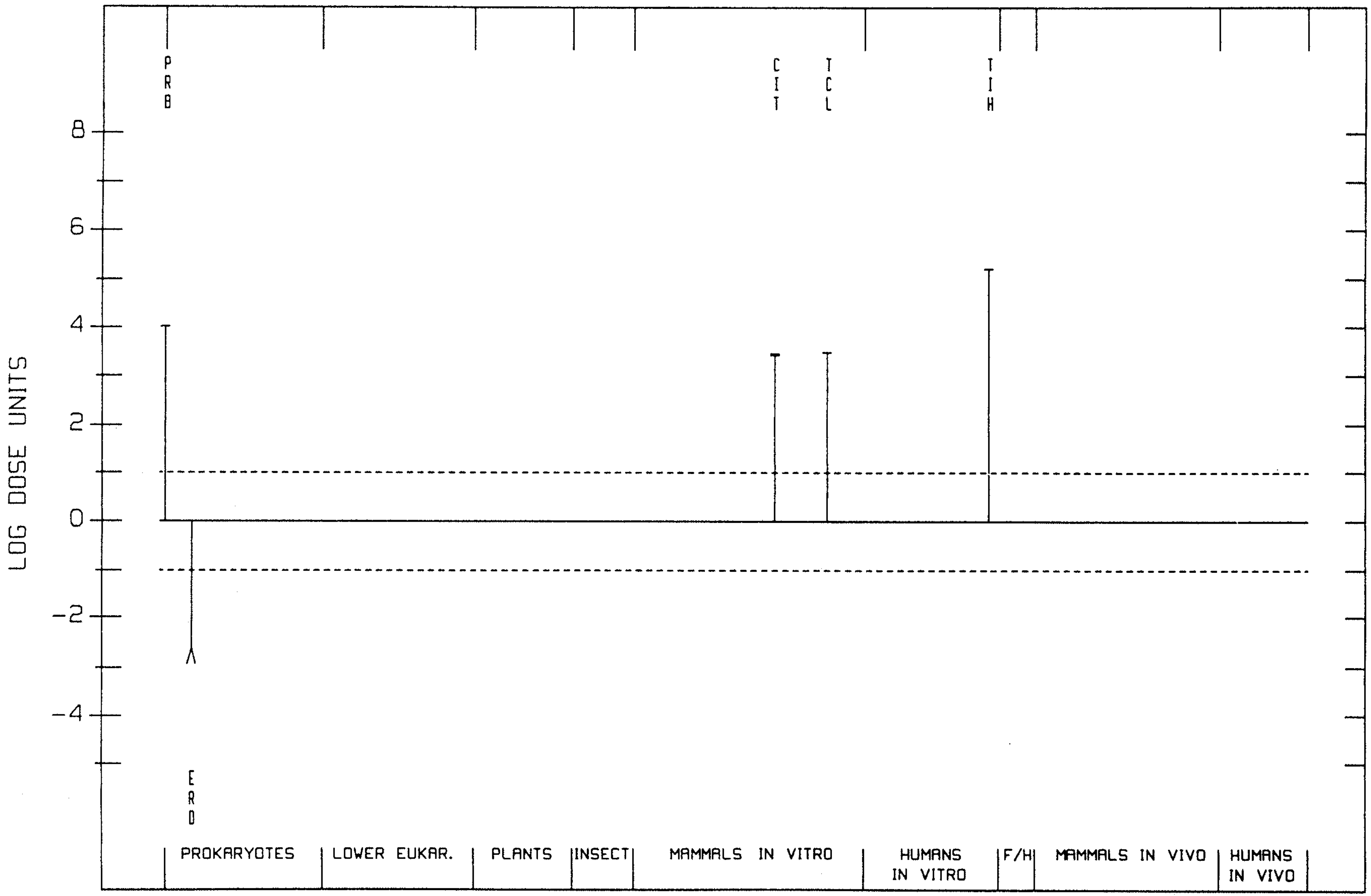
6
4
2
0
-2
-4
ERD
DMMK
MVM
DLM
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

NICKEL ACETATE

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
D	PRB	PROPHAGE, INDUCT/SOS/STRAND BREAKS/X-LINKS	(+)	0	9.4000	ROSSMAN ET AL., 1984
D	ERD	E. COLI REC, DIFFERENTIAL TOXICITY	-	-	417.0000	DE FLORA ET AL., 1984a
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	0:0000	DE FLORA ET AL., 1984a
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	-	0.0000	DE FLORA ET AL., 1984a
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	+	0	38.0000	UMEDA & NISHIMURA, 1979
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	+	0	35.0000	NISHIMURA & UMEDA, 1979
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	33.0000	HANSEN & STERN, 1983
T	TIH	CELL TRANSFORMATION, HUMAN CELLS IN VITRO	+	0	0.6000	BIEDERMANN & LANDOLPH, 1987

[1]Doses are given as concentrations of the element, not the concentration of the compound.

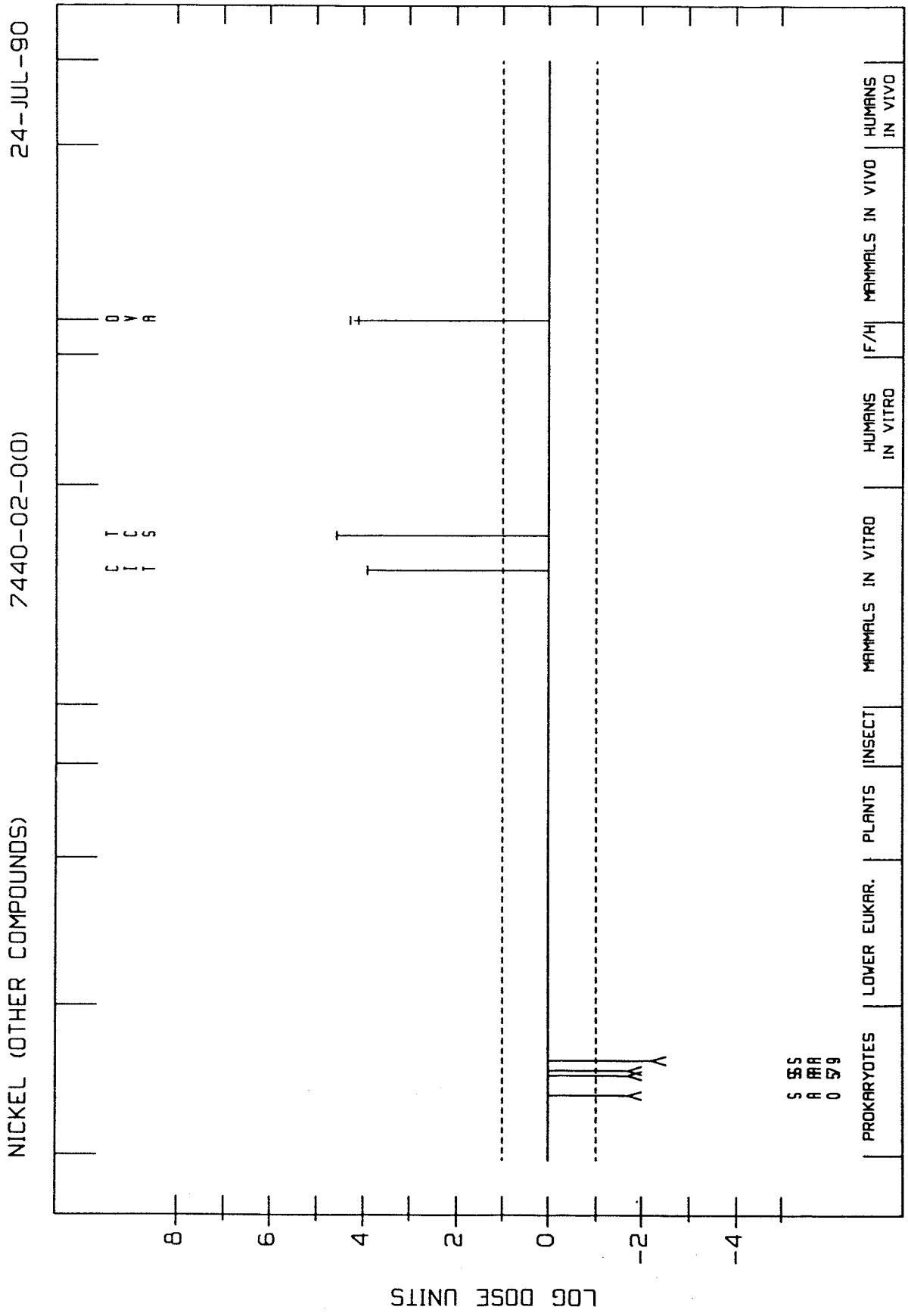
NICKEL ACETATE 6018-89-9 24-JUL-90



NICKEL (OTHER COMPOUNDS)

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE[1] (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	50.0000	HAWORTH ET AL., 1983[2]
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION	-	-	50.0000	HAWORTH ET AL., 1983[2]
G	SA7	S. TYPHIMURIUM TA1537, REVERSE MUTATION	-	-	50.0000	HAWORTH ET AL., 1983[2]
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	167:0000	HAWORTH ET AL., 1983[2]
C	CIT	CHROM ABERR, TRANSFORMED CELLS IN VITRO	+	0	12.0000	NISHIMURA & UMEDA, 1979[3]
T	TCS	CELL TRANSFORMATION, SHE, CLONAL ASSAY	+	0	2.6000	COSTA & MOLLENHAUER, 1980c[4]
D	DVA	STRAND BREAKS/X-LINKS, ANIMALS IN VIVO	+	0	5.0000	CICCARELLI & WETTERHAHN, 1982[5]
D	DVA	STRAND BREAKS/X-LINKS, ANIMALS IN VIVO	+	0	7.5000	CICCARELLI ET AL., 1981[5]

[1]
[2]Doses are given as concentrations of the element, not the concentration of the compound.
[3]Nickelocene
[4]Nickel potassium cyanide
[5]Nickel subselenide (crystalline)
Nickel carbonate


NICKEL (OTHER COMPOUNDS)
7440-02-0(0)
24-JUL-90
LOG DOSE UNITS
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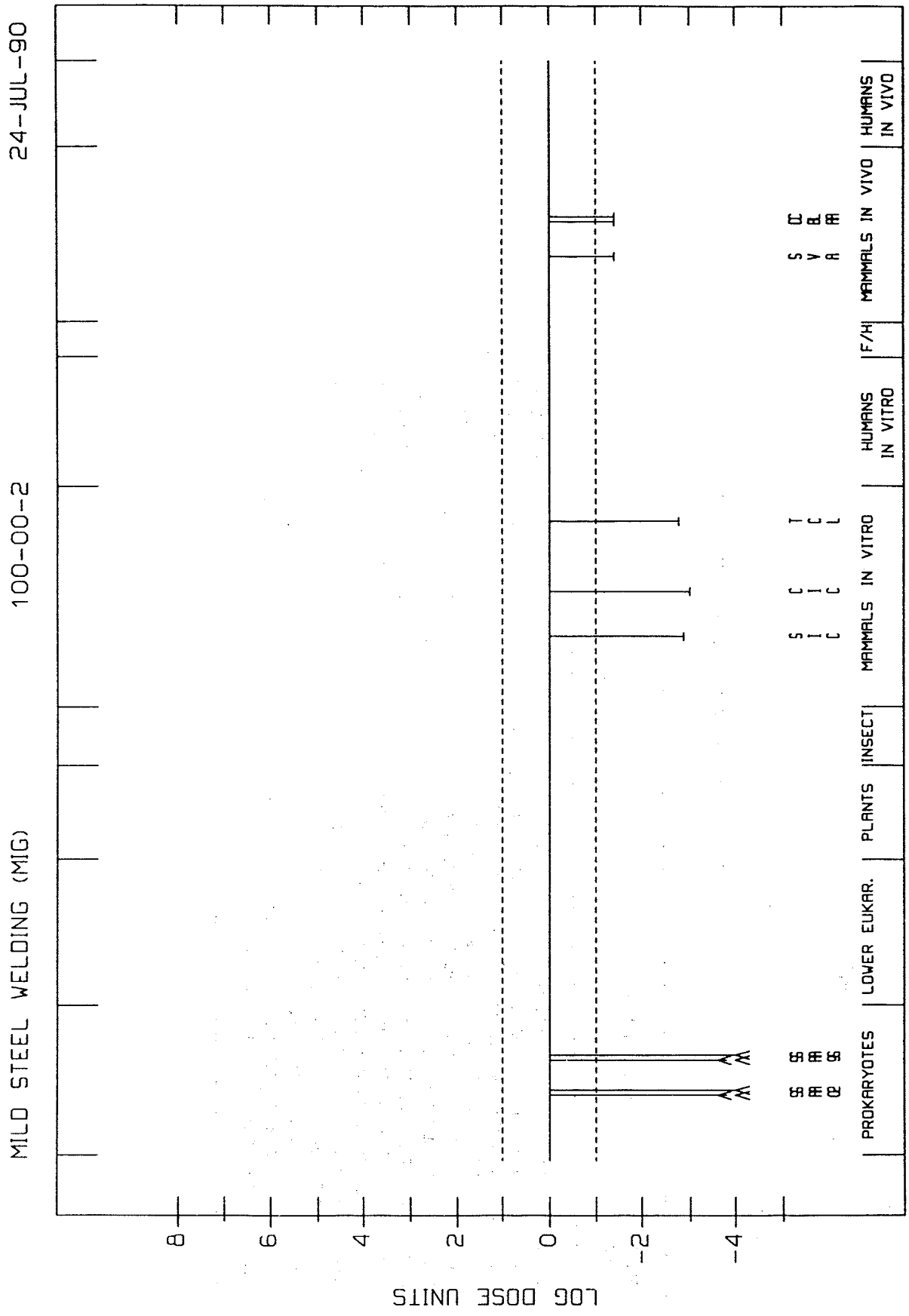
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

MILD STEEL WELDING (METAL INERT GAS)

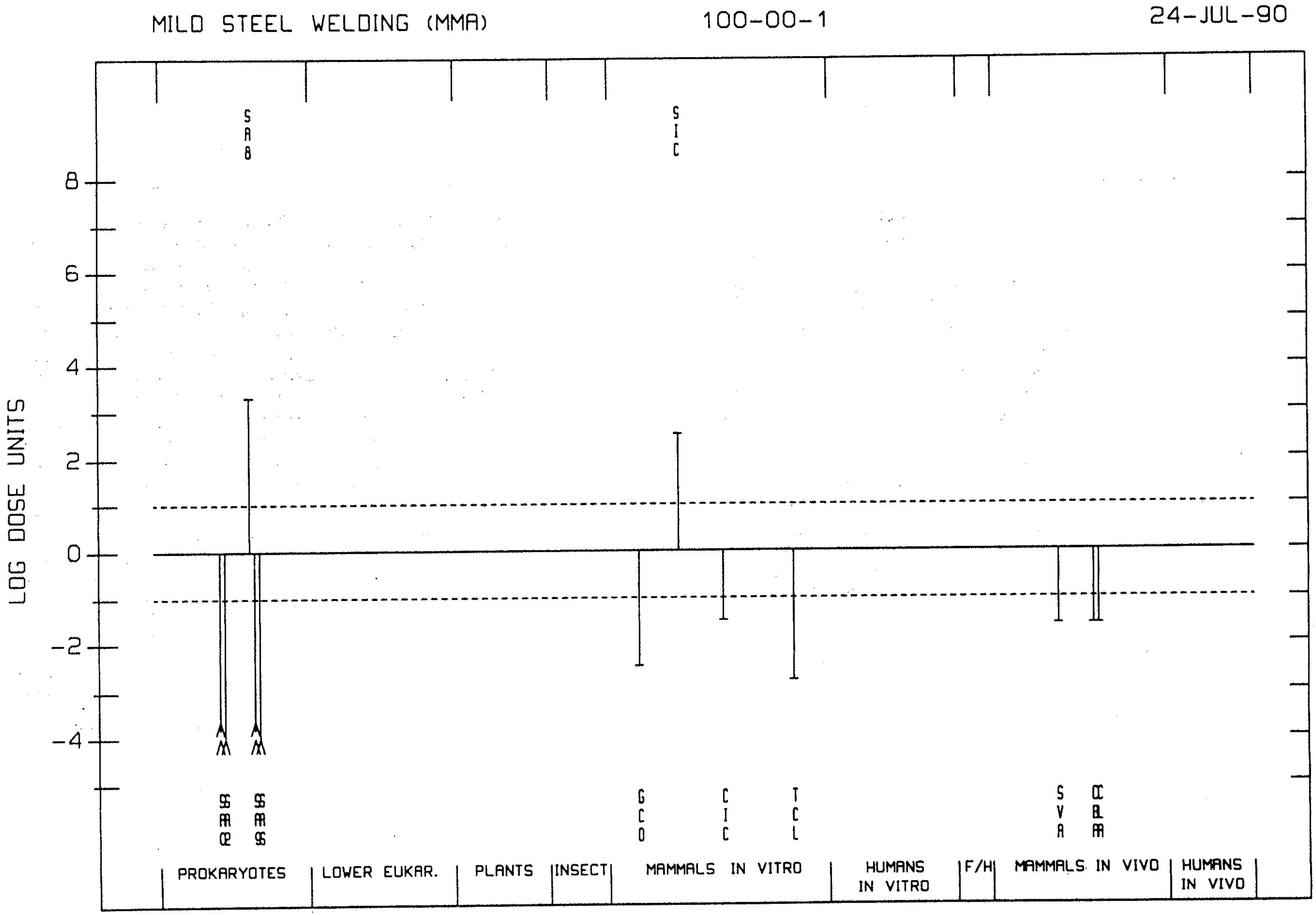
END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE (LED OR HID)	REFERENCE
D	ECD	E. COLI POL A, DIFFERENTIAL TOX (SPOT)	-	-	0.0000	HEDENSTEDT ET AL., 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	0.0000	HEDENSTEDT ET AL., 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	4000.0000	MAXILD ET AL., 1978
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	10000.0000	ETIENNE ET AL., 1986
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	-	10000.0000	ETIENNE ET AL., 1986
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	4000.0000	MAXILD ET AL., 1978
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	10000.0000	ETIENNE ET AL., 1986
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	-	10000.0000	ETIENNE ET AL., 1986
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	750.0000	DE RATT & BAKKER, 1988
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	-	0	1000.0000	ETIENNE ET AL., 1986
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	-	0	600.0000	HANSEN & STERN, 1985
S	SVA	SCE, ANIMALS IN VIVO	-	0	26.0000	ETIENNE ET AL., 1986
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	-	0	26.0000	ETIENNE ET AL., 1986
C	CLA	CHROM ABERR, ANIMAL LEUCOCYTES IN VIVO	-	0	26.0000	ETIENNE ET AL., 1986


MILD STEEL WELDING (MIG)
100-00-2
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

MILD STEEL WELDING (MANUAL METAL ARC)

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE (LED OR HID)	REFERENCE
D	ECD	E. COLI POL A, DIFFERENTIAL TOX (SPOT)	-	-	0.0000	HEDENSTEDT ET AL., 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	0.0000	HEDENSTEDT ET AL., 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	4000.0000	MAXILD ET AL., 1978
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	-	10000.0000	ETIENNE ET AL., 1986
G	SA5	S. TYPHIMURIUM TA1535, REVERSE MUTATION[1]	-	-	10000.0000	ETIENNE ET AL., 1986
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION[2]	+	0	0.0000	BIGGART & RINEHART, 1987
G	SA8	S. TYPHIMURIUM TA1538, REVERSE MUTATION	(+)	0	0.0000	BIGGART & RINEHART, 1987
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	+	50.0000	BIGGART ET AL., 1987
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	4000.0000	MAXILD ET AL., 1978
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	-	10000.0000	ETIENNE ET AL., 1986
G	GCO	MUTATION, CHO CELLS IN VITRO	-	-	10000.0000	ETIENNE ET AL., 1986
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	-	0	300.0000	ETIENNE ET AL., 1986
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	300.0000	DE RATT & BAKKER, 1988
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	-	0	32.0000	ETIENNE ET AL., 1986
S	SVA	SCE, ANIMALS IN VIVO	-	0	600.0000	HANSEN & STERN, 1985
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	-	0	39.0000	ETIENNE ET AL., 1986
C	CLA	CHROM ABERR, ANIMAL LEUCOCYTES IN VIVO	-	0	39.0000	ETIENNE ET AL., 1986
			-	0	39.0000	ETIENNE ET AL., 1986

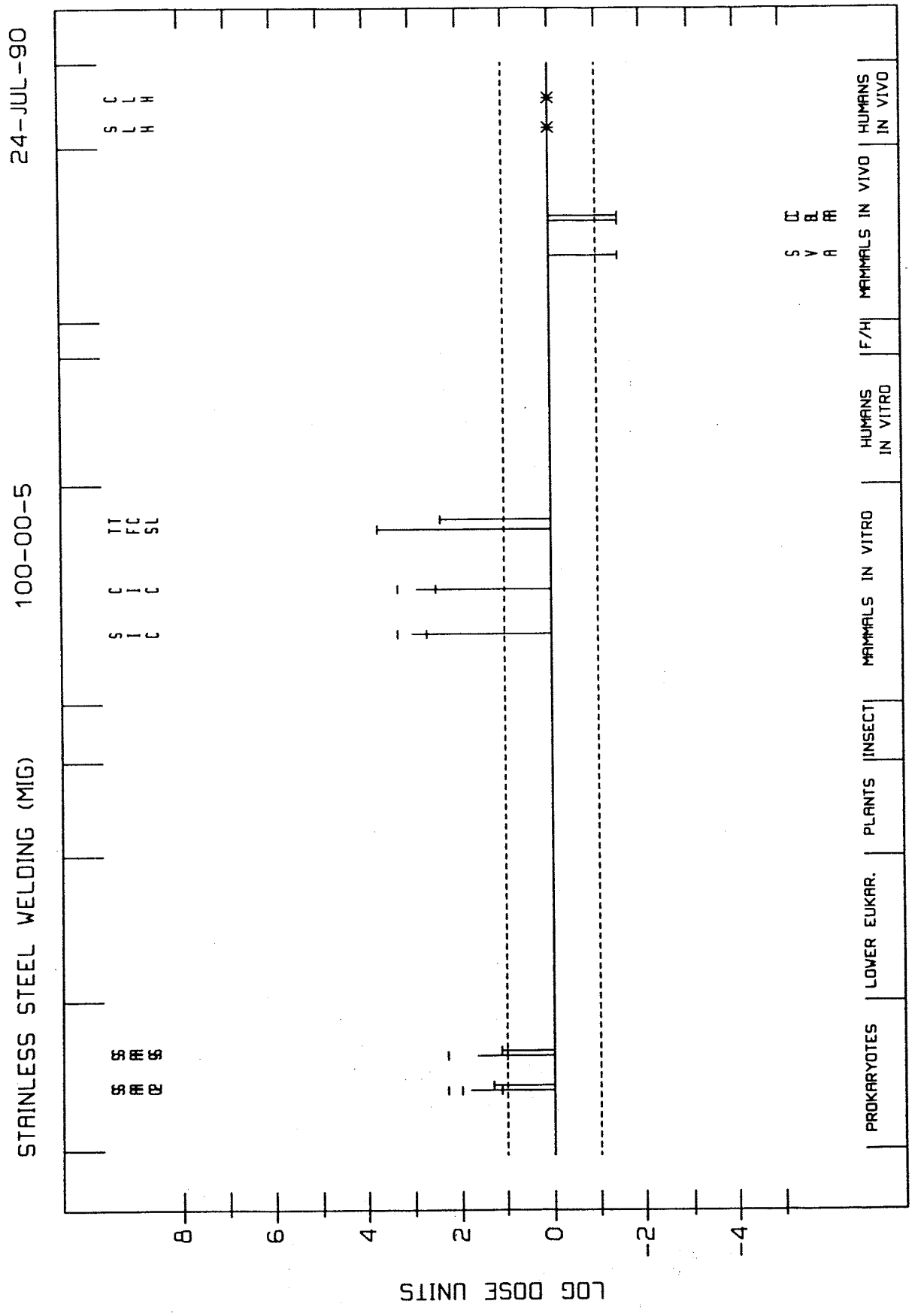
[1]Gaseous phase only
[2]Particulates only


MILD STEEL WELDING (MMA)
100-00-1
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
SAB
SIC
SA2
SAS
GCO
CIC
TCL
SVA
CBA
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

STAINLESS STEEL WELDING (METAL INERT GAS)

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE (LED OR HID)	REFERENCE
D	ECD	E. COLI POL A, DIFFERENTIAL TOX (SPOT)	-	-	0.0000	HEDENSTEDT ET AL., 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	(+)	-	500.0000	HEDENSTEDT ET AL., 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	-	1000.0000	MAXILD ET AL., 1978
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	(+)	-	7500:0000	ETIENNE ET AL., 1986
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	+	5000.0000	ETIENNE ET AL., 1986
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	(+)	500.0000	MAXILD ET AL., 1978
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	(+)	-	10000.0000	ETIENNE ET AL., 1986
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	(+)	-	7500.0000	ETIENNE ET AL., 1986
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	200.0000	DE RATT & BAKKER, 1988
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	50.0000	KOSHI, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	50.0000	KOSHI, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	320.0000	ETIENNE ET AL., 1986
T	TFS	CELL TRANSFORMATION, SHE, FOCUS ASSAY	+	0	18.0000	HANSEN & STERN, 1985
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	400.0000	HANSEN & STERN, 1985
S	SVA	SCE, ANIMALS IN VIVO	-	0	31.0000	ETIENNE ET AL., 1986
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	-	0	31.0000	ETIENNE ET AL., 1986
C	CLA	CHROM ABERR, ANIMAL LEUCOCYTES IN VIVO	-	0	31.0000	ETIENNE ET AL., 1986
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO[1]	(+)	0	0.0000	KOSHI ET AL., 1984
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO[1]	(+)	0	0.0000	KOSHI ET AL., 1984

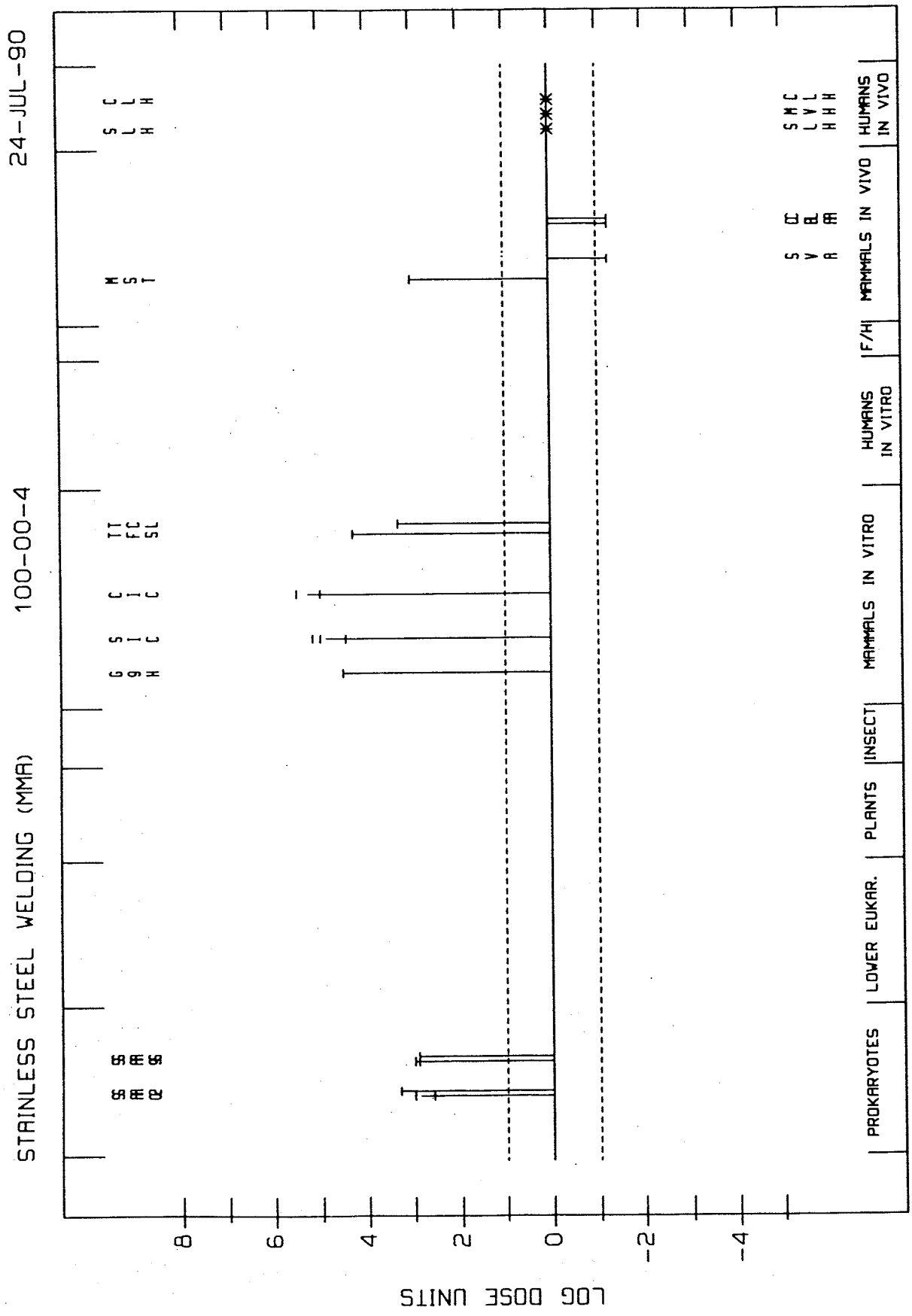
[1]Exposure also to Manual Metal Arc


24-JUL-90
100-00-5
STAINLESS STEEL WELDING (MIG)
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO

STAINLESS STEEL WELDING (MANUAL METAL ARC)

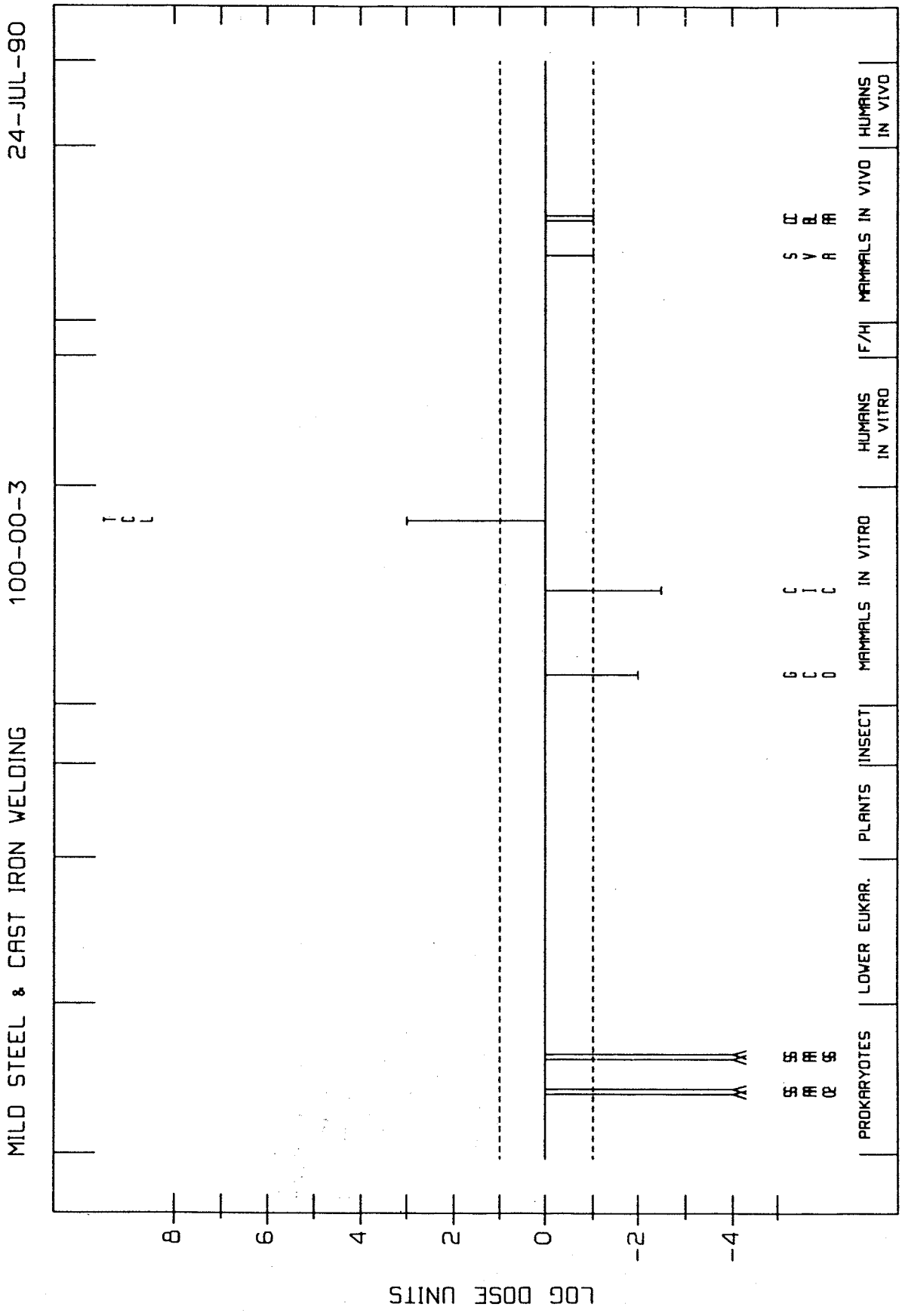
END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE (LED OR HID)	REFERENCE
D	ECD	E. COLI POL A, DIFFERENTIAL TOX (SPOT)	+	+	0.0000	HEDENSTEDT ET AL., 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	–	100.0000	HEDENSTEDT ET AL., 1977
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	100.0000	MAXILD ET AL., 1978
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	+	+	250:0000	ETIENNE ET AL., 1986
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	+	+	50.0000	ETIENNE ET AL., 1986
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	–	100.0000	HEDENSTEDT ET AL., 1977
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	+	100.0000	MAXILD ET AL., 1978
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	+	–	125.0000	ETIENNE ET AL., 1986
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	+	+	125.0000	ETIENNE ET AL., 1986
G	GCO	MUTATION, CHO CELLS IN VITRO	?	0	10.0000	ETIENNE ET AL., 1986
G	G9H	MUTATION, CHL V79 CELLS, HPRT	?	0	10.0000	HEDENSTEDT ET AL., 1977
G	G9H	MUTATION, CHL V79 CELLS, HPRT	+	0	3.0000	ETIENNE ET AL., 1986
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	3.5000	DE RATT & BAKKER, 1988
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	0.7000	BAKER ET AL., 1986
S	SIC	SCE, CHINESE HAMSTER CELLS IN VITRO	+	0	1.0000	KOSHI, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	1.0000	KOSHI, 1979
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	+	0	0.3200	ETIENNE ET AL., 1986
T	TFS	CELL TRANSFORMATION, SHE, FOCUS ASSAY	+	0	5.0000	HANSEN & STERN, 1985
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	50.0000	HANSEN & STERN, 1985
G	MST	MOUSE SPOT TEST	+	0	100.0000	KNUDSON, 1980
S	SVA	SCE, ANIMALS IN VIVO	–	0	18.0000	ETIENNE ET AL., 1986
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	–	0	18.0000	ETIENNE ET AL., 1986
C	CLA	CHROM ABERR, ANIMAL LEUCOCYTES IN VIVO	–	0	18.0000	ETIENNE ET AL., 1986
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	–	0	0.0000	HUSGAFVEL-PURSIANEN ET AL., 1982
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO	–	0	0.0000	LITTORIN ET AL., 1983
S	SLH	SCE, HUMAN LYMPHOCYTES IN VIVO[1]	(+)	0	0.0000	KOSHI ET AL., 1984
M	MVH	MICRONUCLEUS TEST, HUMAN CELLS IN VIVO	–	0	0.0000	LITTORIN ET AL., 1983
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	–	0	0.0000	HUSGAFVEL-PURSIANEN ET AL., 1982
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO	–	0	0.0000	LITTORIN ET AL., 1983
C	CLH	CHROM ABERR, HUMAN LYMPHOCYTES IN VIVO[1]	(+)	0	0.0000	KOSHI ET AL., 1984

[1]Exposure also to Metal Inert Gas


24-JUL-90
100-00-4
STAINLESS STEEL WELDING (MMA)
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/HI
MAMMALS IN VIVO
HUMANS IN VIVO

MILD STEEL & CAST IRON WELDING WITH NICKEL-RICH ELECTRODES

END POINT	TEST CODE	TEST SYSTEM	RESULTS NM	RESULTS M	DOSE (LED OR HID)	REFERENCE
G	SA0	S. TYPHIMURIUM TA100, REVERSE MUTATION	-	-	10000.0000	ETIENNE ET AL., 1986
G	SA2	S. TYPHIMURIUM TA102, REVERSE MUTATION	-	-	10000.0000	ETIENNE ET AL., 1986
G	SA9	S. TYPHIMURIUM TA98, REVERSE MUTATION	-	-	10000.0000	ETIENNE ET AL., 1986
G	SAS	S. TYPHIMURIUM (OTHER), REVERSE MUTATION	-	-	10000:0000	ETIENNE ET AL., 1986
G	GCO	MUTATION, CHO CELLS IN VITRO	-	0	100.0000	ETIENNE ET AL., 1986
C	CIC	CHROM ABERR, CHINESE HAMSTER CELLS IN VITRO	-	0	320.0000	ETIENNE ET AL., 1986
T	TCL	CELL TRANSFORMATION, OTHER CELL LINES	+	0	100.0000	HANSEN & STERN, 1984
S	SIH	SCE, OTHER HUMAN CELLS IN VITRO	+	0	0.0000	NIEBUHR ET AL., 1980
S	SVA	SCE, ANIMALS IN VIVO	-	0	10.0000	ETIENNE ET AL., 1986
C	CBA	CHROM ABERR, ANIMAL BONE MARROW IN VIVO	-	0	10.0000	ETIENNE ET AL., 1986
C	CLA	CHROM ABERR, ANIMAL LEUCOCYTES IN VIVO	-	0	10.0000	ETIENNE ET AL., 1986


MILD STEEL & CAST IRON WELDING
100-00-3
24-JUL-90
LOG DOSE UNITS
8
6
4
2
0
-2
-4
PROKARYOTES
LOWER EUKAR.
PLANTS
INSECT
MAMMALS IN VITRO
HUMANS IN VITRO
F/H
MAMMALS IN VIVO
HUMANS IN VIVO