IARC MONOGRAPHS

SOME AROMATIC AMINES AND RELATED COMPOUNDS

VOLUME 127

IARC MONOGRAPHS ON THE IDENTIFICATION OF CARCINOGENIC HAZARDS TO HUMANS

International Agency for Research on Cancer

World Health Organization

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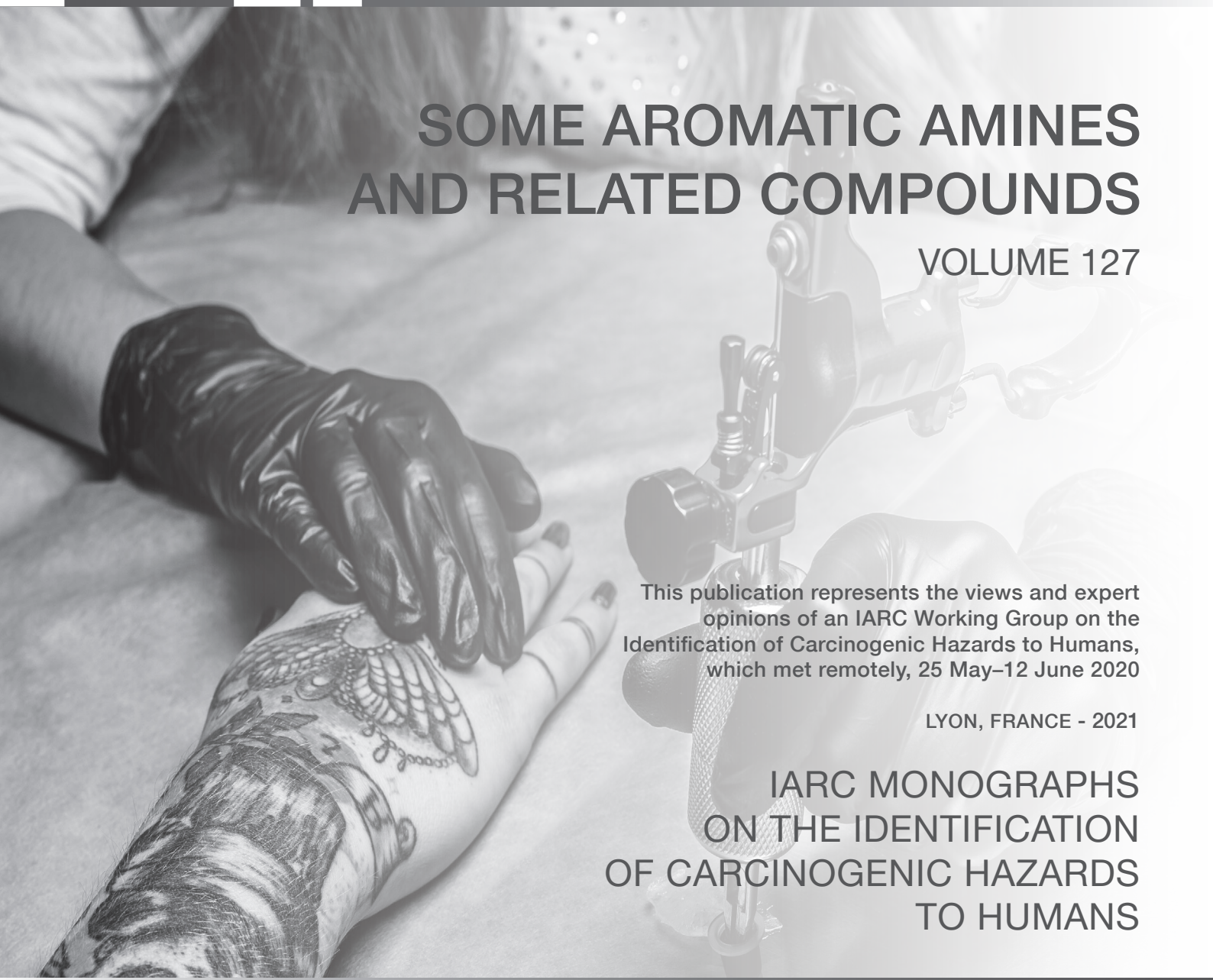

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This publication represents the views and expert opinions of an IARC Working Group on the Identification of Carcinogenic Hazards to Humans, which met remotely, 25 May–12 June 2020

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In 1969, the International Agency for Research on Cancer (IARC) initiated a programme on the evaluation of the carcinogenic hazard of chemicals to humans, involving the production of critically evaluated monographs on individual chemicals. The programme was subsequently expanded to include evaluations of carcinogenic hazards associated with exposures to complex mixtures, lifestyle factors and biological and physical agents, as well as those in specific occupations. The objective of the programme is to elaborate and publish in the form of monographs critical reviews of data on carcinogenicity for agents to which humans are known to be exposed and on specific exposure situations; to evaluate these data in terms of cancer hazard to humans with the help of international working groups of experts in carcinogenesis and related fields; and to identify gaps in evidence. The lists of IARC evaluations are regularly updated and are available on the internet at https://monographs.iarc.fr/.

This programme has been supported since 1982 by Cooperative Agreement U01 CA33193 with the United States National Cancer Institute, Department of Health and Human Services. Additional support has been provided since 1986 by the European Commission Directorate-General for Employment, Social Affairs, and Inclusion, initially by the Unit of Health, Safety and Hygiene at Work, and since 2014 by the European Union Programme for Employment and Social Innovation "EaSI" (2014–2020) (for further information please consult: https://ec.europa.eu/social/easi). Support has also been provided since 1992 by the United States National Institute of Environmental Health Sciences, Department of Health and Human Services. The contents of this volume are solely the responsibility of the Working Group and do not necessarily represent the official views of the United States National Cancer Institute, the United States National Institute of Environmental Health Sciences, the United States Department of Health and Human Services, or the European Commission.

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About the cover: A tattoo artist at work. Aniline and *ortho*-anisidine are used in the synthesis of pigments that are ingredients of tattoo inks, in which both agents have been detected.

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IARC MONOGRAPHS

This volume of the *IARC Monographs* provides evaluations of the carcinogenicity of six chemicals: *ortho*-anisidine and *ortho*-anisidine hydrochloride, *ortho*-nitroanisole, aniline and aniline hydrochloride, and cupferron.

ortho-Anisidine, and its salt, *ortho*-anisidine hydrochloride, are mainly used as chemical intermediates in the synthesis of azo pigments and dyes for consumer products, textiles, paper, and cardboard.

ortho-Nitroanisole is used primarily as a precursor for the manufacture of *ortho*-anisidine.

Aniline, the parent compound of aniline hydrochloride, is a High Production Volume chemical used in the synthesis of isocyanates, dyes and pigments, and rubber-processing chemicals, and in the production of pharmaceuticals, herbicides, fungicides, and of many consumer goods, including textiles, leather, and colourants, including tattoo ink. Tobacco smoke is a main source of exposure to aniline in the general population.

Cupferron is a reagent used to separate metals such as copper, iron, tin, vanadium, and thorium from other metals.

For all agents, data were sparse regarding exposure levels, but indicated that exposures are higher in occupational situations than in the general population.

An *IARC Monographs* Working Group reviewed evidence from cancer studies in humans, cancer bioassays in experimental animals, and mechanistic studies to assess the carcinogenic hazard to humans of exposure to these agents and concluded that:

- *ortho*-anisidine and *ortho*-anisidine hydrochloride, *ortho*-nitroanisole, and aniline and aniline hydrochloride are *probably carcinogenic to humans (Group 2A)*
- cupferron is *possibly carcinogenic to humans (Group 2B)*.