



# COBALT, ANTIMONY COMPOUNDS, AND WEAPONS-GRADE TUNGSTEN ALLOY

VOLUME 131

This publication represents the views and expert opinions of an IARC Working Group on the Identification of Carcinogenic Hazards to Humans, which met remotely, 2–18 March 2022

LYON, FRANCE - 2023

IARC MONOGRAPHS  
ON THE IDENTIFICATION  
OF CARCINOGENIC HAZARDS  
TO HUMANS

# SUMMARY OF FINAL EVALUATIONS

## Summary of final evaluations for Volume 131

Agent	Evidence stream			Overall evaluation
	Cancer in humans	Cancer in experimental animals	Mechanistic evidence	
Cobalt metal (without tungsten carbide or other metal alloys)	<i>Inadequate</i>	<i>Sufficient</i>	<i>Strong</i>	Group 2A
Soluble cobalt(II) salts	<i>Inadequate</i>	<i>Sufficient<sup>a</sup> Limited<sup>b</sup></i>	<i>Strong</i>	Group 2A
Cobalt(II) oxide	<i>Inadequate</i>	<i>Sufficient</i>	<i>Limited</i>	Group 2B
Cobalt(II,III) oxide	<i>Inadequate</i>	<i>Inadequate</i>	<i>Limited</i>	Group 3
Cobalt(II) sulfide	<i>Inadequate</i>	<i>Limited</i>	<i>Inadequate</i>	Group 3
Other cobalt(II) compounds	<i>Inadequate</i>	<i>Inadequate</i>	<i>Inadequate</i>	Group 3
Trivalent antimony	<i>Limited</i>	<i>Sufficient<sup>c</sup></i>	<i>Strong</i>	Group 2A
Pentavalent antimony	<i>Inadequate</i>	<i>Inadequate</i>	<i>Limited</i>	Group 3
Weapons-grade tungsten (with nickel and cobalt) alloy	<i>Inadequate</i>	<i>Sufficient</i>	<i>Limited</i>	Group 2B

<sup>a</sup> There is *sufficient evidence* in experimental animals for the carcinogenicity of cobalt(II) sulfate.

<sup>b</sup> There is *limited evidence* in experimental animals for the carcinogenicity of cobalt(II) chloride.

<sup>c</sup> There is *sufficient evidence* in experimental animals for the carcinogenicity of antimony trioxide.

