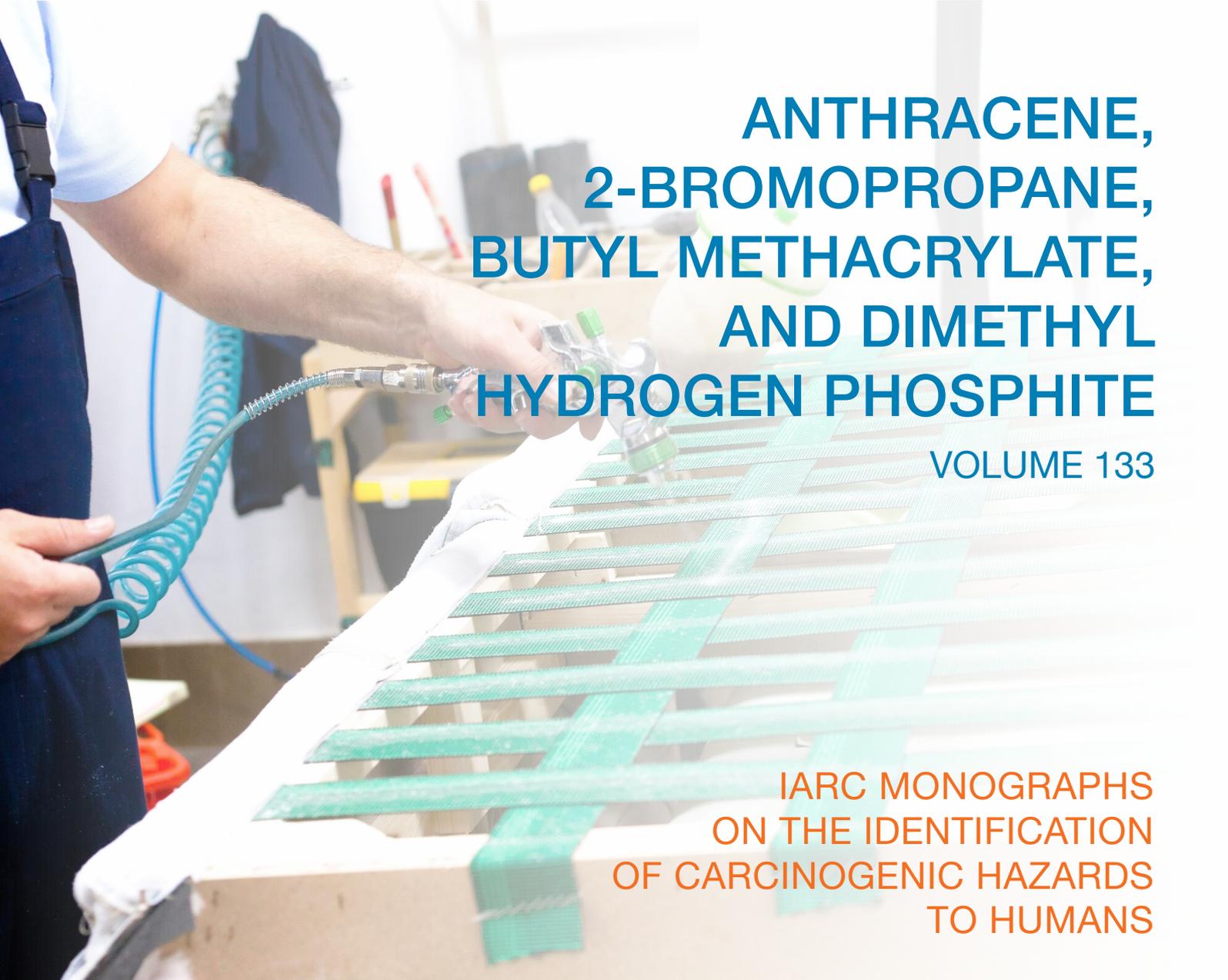


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IARC MONOGRAPHS



**ANTHRACENE,  
2-BROMOPROPANE,  
BUTYL METHACRYLATE,  
AND DIMETHYL  
HYDROGEN PHOSPHITE**

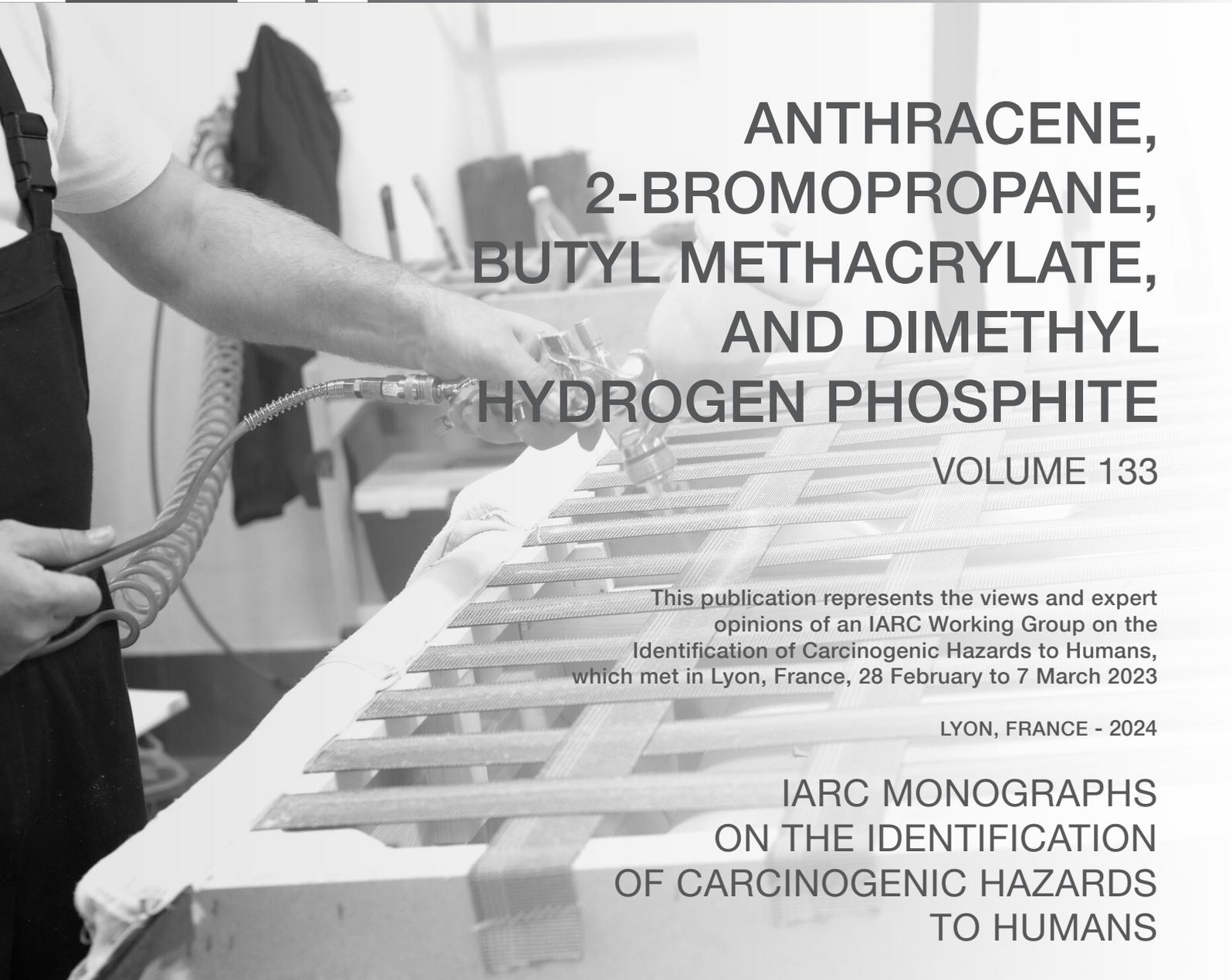
VOLUME 133

IARC MONOGRAPHS  
ON THE IDENTIFICATION  
OF CARCINOGENIC HAZARDS  
TO HUMANS

International Agency for Research on Cancer



World Health  
Organization



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**VOLUME 133**

This publication represents the views and expert opinions of an IARC Working Group on the Identification of Carcinogenic Hazards to Humans, which met in Lyon, France, 28 February to 7 March 2023

LYON, FRANCE - 2024

**IARC MONOGRAPHS  
ON THE IDENTIFICATION  
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## IARC MONOGRAPHS

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.who.int/>.

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” (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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The *IARC Monographs* Working Group alone is responsible for the views expressed in this publication.



About the cover: The agents evaluated in this volume have varied industrial uses, including in coatings and adhesives, such as those used in furniture manufacture.

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The IARC *Monographs* Working Group and Secretariat for Volume 133, Anthracene, 2-bromopropane, butyl methacrylate, and dimethyl hydrogen phosphite, which met in Lyon, France, on 28 February to 7 March 2023.

This volume of the *IARC Monographs* provides evaluations of the carcinogenicity of four agents: anthracene, 2-bromopropane, butyl methacrylate, and dimethyl hydrogen phosphite.

2-Bromopropane is a solvent used in dry cleaning and in adhesive production and application, and it also occurs as an impurity of 1-bromopropane (used since the 1990s as a substitute for ozone-depleting solvents).

Anthracene, butyl methacrylate, and dimethyl hydrogen phosphite are all chemicals with a high production volume.

Anthracene is a high-production-volume polycyclic aromatic hydrocarbon that is mainly used as an intermediate in the manufacture of dyes and pigments, pyrotechnics, coatings, wood preservatives, pesticides, and organic chemicals. Also formed by tobacco smoke, biomass burning (indoor and outdoor), traffic and industry emissions, and contaminated food, it is ubiquitous in the environment and is a widespread environmental pollutant.

Butyl methacrylate is used in coatings, polyvinyl chloride plastics, polypropylene non-woven materials, glues, caulks, inks and paints, pesticides, and health-care materials.

Dimethyl hydrogen phosphite is used as an intermediate in the manufacture of adhesives, lubricants, pesticides, and pharmaceuticals, and as a stabilizer in oil and plaster, a steel corrosion inhibitor, and a flame retardant.

For all four agents, occupational and environmental exposures may occur.

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

- 2-Bromopropane is *probably carcinogenic to humans (Group 2A)*;
- Anthracene, butyl methacrylate, and dimethyl hydrogen phosphite are *possibly carcinogenic to humans (Group 2B)*.

