BOOK REVIEW

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A Review of *Formaldehyde Sensitivity and Toxicity*

REFERENCE: Feinman, S. E., *Formaldehyde Sensitivity and Toxicity*, CRC Press, Inc., 2000 Corporate Blvd., NW, Boca Raton, FL 33431, 1989.

This book is an excellent compendium of studies related to the potential toxic effects of formaldehyde. Although the majority of chapters deal with allergenicity and other effects on the skin and respiratory tract, there is a broad base of information on formaldehyde chemistry, on quantitation of exposure, and on other acute and chronic effects in humans and animals. The author has surveyed the literature in these areas, but also has added valuable interpretation of the results. In most cases, anecdotal data are differentiated from results of controlled scientific studies. However, the overwhelming number of uncontrolled studies may bias the casual reader towards their results.

The book has been intended for a wide audience, including toxicologists and dermatologists, but also consumers and, interestingly, lawyers. For the scientist and clinician, the author provides a good survey of existing knowledge in the various fields. The book is well documented with appropriate references that allow confirmation or further information. The book generally presents careful scientific statements; for example, qualifying arguments are provided so that the conclusions are not overstated. For instance, in Chapter 6, it is strongly emphasized that the patch testing methods are extremely variable and that standardization is needed to produce useful results. Its usefulness for scientists makes the book somewhat inappropriate for the interested lay person. It seems a bit too dry and fact-filled for the typical consumer. In spite of the wealth of basic knowledge in certain areas, it is hard to know whether the lay reader would have enough background information to truly appreciate the various conclusions on the potential effects of formaldehyde.

The book is very well organized in three sections, beginning with basic chapters on chemistry, biology, and testing methods, then having survey chapters on the various skin effects, and ending with chapters on acute and chronic toxicities. Chapter 1 describes well the chemical forms of formaldehyde and its resins. However, the methods section is too complex for the lay reader, for there is no discussion of the proper circumstances for the use of each test. Chapter 2 is somewhat scary in that the lengthy tables suggest that there is a high frequency of exposure, but, unfortunately, do not give an assessment of the magnitude of the various exposures. Chapters 3, 4, 5, 12, and 17 are probably the premier sections of this book in that they provide an excellent review of background areas, such as immunology, skin and respiratory system physiology, patch testing techniques, and epidemiologic methods. Chapters 6 through 11 are basically surveys of the

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allergic and nonallergic effects of formaldehyde on the skin by various exposures. As such, they tend to be rather mundane in listing the results of numerous scientific and anecdotal studies of such effects. Chapter 14 attempts to discuss the acute and chronic toxicity and is the weakest section of the book. One drawback is that it focusses on areas previously mentioned, such as irritation of the skin and respiratory tract. Missing from this chapter is a discussion of the potential role of formaldehyde in the toxicity of methanol. Much has been learned about the effects, metabolism, and pharmacokinetics of formaldehyde from such studies. The section of this chapter on nonneoplastic lesions in the respiratory tract is a good prelude to Chapter 16 on carcinogenicity. Chapters 15 through 17, on the possible chronic effects, concisely summarize the voluminous data on the genotoxicity and carcinogenicity of formaldehyde. The author presents suggestive evidence for human carcinogenicity, but neatly sidesteps the ultimate conclusion by stating, "(E)xtrapolations to humans based on the CIIT rat study have varied widely and will not be reviewed." Chapter 18, on structure-activity relationships, is rather tenuous because of the lack of data. The statement that acetaldehyde is thought to be responsible for the teratogenicity of ethanol is not strongly supported by current evidence.

In summary, the author does a commendable job. The final chapters of summary and conclusions draw everything together by organ systems and are a great way to end such a book.