Acid Deposition: Long-term Trends


The National Research Council has undertaken a series of studies to summarize what is known about pollutant deposition patterns and effects. Earlier volumes focused on processes, and this sixth volume assesses the patterns of acid deposition. This assessment used published data, including some original interpretations of data, to determine if emissions, deposition, and effects have been temporally linked during the past several decades. Following a summary and synthesis chapter, R. Husar describes his reconstruction of emission rates for S and N oxides for the past 100 yr. R. Bradley discusses uncertainties in acid deposition patterns due to fluctuations in climate. J. Trijonis catalogs trends in visibility, and G. Stensland and others characterize trends in precipitation chemistry.

The sixth chapter describes the decline of red spruce (Picea rubens Sarg.) stands in the northern Appalachians—A. Johnson and S. McLaughlin conclude there is no evidence that acid deposition is an important factor in red spruce decline. J. Kramer and others look for changes in the acidity and alkalinity of lakes and streams by comparing trends over time, including painstaking corrections for historical differences in analytic methods. T. Haines concludes that lake acidification is the most probable cause of decline in fish populations in at least a few well-documented cases. D. Charles and S. Norton summarize available information on paleontological evidence of changes in lake acidity and the deposition of metal pollutants. These nine chapters are followed by five appendices that describe in detail the methods and data sets used in preparing each chapter.

The synthesis chapter identifies 10 major conclusions from the Committee. Among these conclusions are: a causal relationship exists between anthropogenic sources of S and the deposition of SO2; emissions of acid precursors have been high in North America since the early 1900s; SO2 fluxes are associated with decreases in stream alkalinity; changes in the pH and alkalinity of lakes is difficult to establish, but that the alkalinity of some lakes has decreased by >100 μmol/L over 50 yr, which they conclude is too great to be caused by acid deposition alone; and the role of acid deposition in declining forest growth cannot be determined from available data.

The topics in this book are also covered in hundreds of other publications—the value of this volume rests on the authors' careful analyses, their clear documentation of the datasets and methods, and the integration among topics. The members of the Committee on Monitoring and Assessment of Trends in Acid Deposition deserve great credit for producing this benchmark work.—DAN BINKLEY, School of Forestry and Environmental Studies, Duke University, Durham, NC 27706.

Speciation of Fission and Activation Products in the Environment


This book is the proceedings of the Speciation-85 Seminar organized by the Commission of the European Communities (CEC) and the British National Radiological Protection Board, held in Christ Church, Oxford, UK, 16-19 Apr. 1985. The meeting was well-attended by international participants who were most active and informed in this field. The book serves as an interim report of the speciation of fission and activation products in the environment and underscores once again the importance of chemical forms of elements relative to their bioavailability, environmental mobility, and ecological effects.

The seminar was organized into seven sessions: (1) Techniques for Studying Speciation (eight papers); (2) Soils and Strata (nine papers); (3) Gastrointestinal Uptake (seven papers); (4) Speciation of Iodine (five papers); (5) Freshwater Environment (four papers); (6) Marine Environment (six papers); and (7) Speciation in Plants and Microorganisms (seven papers). Each session began with a review paper, presented by authoritative individuals. Major elements discussed included the transuranic elements, Tc, I, and Co.

This book should also be of general interest to students and professionals researching nonradioactive trace elements (metals), as some of these radionuclides can be used as analogs for certain stable elements. The radionuclides treated in the book varied from extremely insoluble to highly soluble. Because the book was published within a year, the information presented is current.

In view of the nuclear reactor accident in Chernobyl, USSR, this book is timely, and aids the reader in comprehending the environmental behavior of dispersed radionuclides and their still uncertain effects to the food chain pathway.—D.C. ADRIANO, Savannah River Ecology Laboratory, University of Georgia, P.O. Drawer E, Aiken, SC 29801.