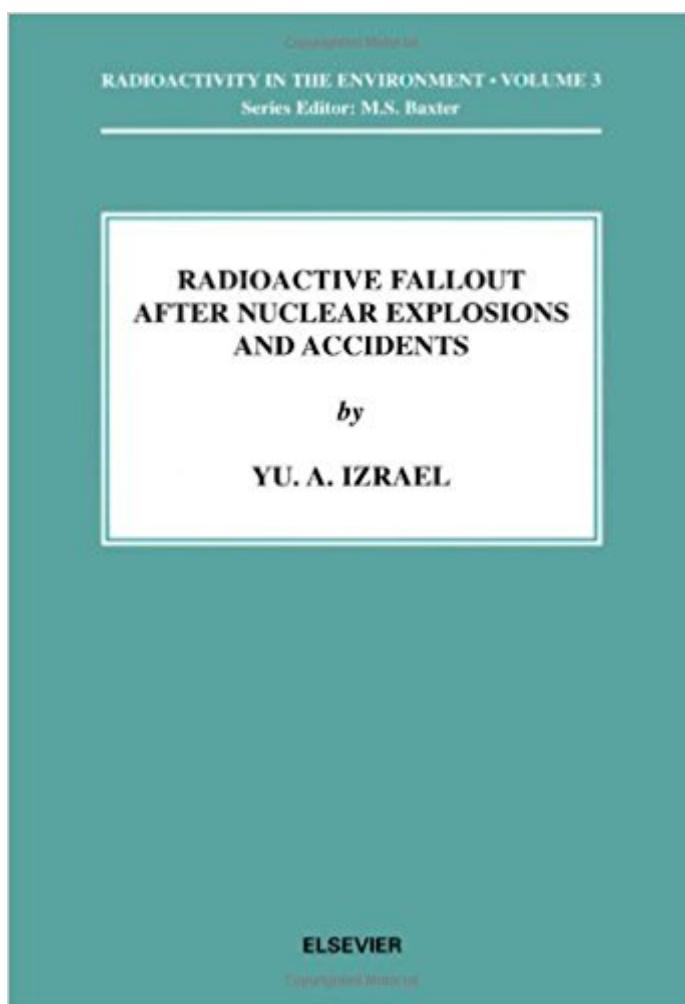


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Radioactive Fallout After Nuclear Explosions And Accidents (Radioactivity In The Environment)



Synopsis

To achieve successful solutions to the problems resulting from local, distant and global radioactive fallout after nuclear explosions and accidents and to achieve successful retrospective analyses of the radiation conditions from recent observations, certain information is needed: the distribution of the exposure dose rate in the atmosphere and in a country; the distribution of radionuclides in natural environments and the nuclide composition of the radioactive fallout; the features of formation of the aerosol particle-carriers of the radioactivity and of the nuclide distribution of the particles of different sizes formed under different conditions; the processes involved in the migration of radioactive products in different zones and environments; the external and internal effects of nuclear radiation on human beings. This monograph is devoted to a number of these problems, namely, to studies of the radioactive fallout composition, the formation of the aerosol particles that transport the radioactive products and to the analysis of the external radiation doses resulting from nuclear explosions and/or accidents. Problems of restoration and rehabilitation of contaminated land areas are also touched upon in the monograph. To solve such problems one requires knowledge of the mobility of radionuclides, an understanding of their uptake by plants, their transportation within the food chain and finally their uptake by animal and/or human organisms. The results of many years of study of radioactive fallout from atmospheric and underground nuclear explosions and accidents are summarized in this book. It is intended for various specialists - geophysicists, ecologists, health experts and inspectors, as well as those who are concerned with radioactive contamination of natural environments.

Book Information

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Customer Reviews

Academician Professor Yuri A. Izrael is one of Russia's and indeed the world's top names in the environmental and nuclear sciences. As the most senior scientist involved in the monitoring, behavioural and assessment studies at and around the previously secret nuclear weapon tests of the former Soviet Union and at the Chernobyl and other nuclear accidents, Professor Izrael has a wealth of unique knowledge and experience of the science of these sites of special scientific interest. Indeed, he has himself pioneered much of that science. The scientific career of Yuri A. Izrael, Doctor of Sciences (Physics and Mathematics), Professor and Member of the Russian Academy of Sciences as well as a number of other academies, has been devoted to nuclear and environmental sciences, meteorology and climatology. Born in 1930, he worked at first in the Geophysical Institute and then in the Institute of Applied Geophysics of the USSR Academy of Sciences, where he progressed from junior scientist to Institute Director (1969). He defended his PhD. (1963) and D.Se. (1969) theses (in the fields of physical and mathematical sciences). Since the beginning of his scientific career, Professor Izrael specialized particularly on the meteorological aspects of both radioactive contamination and chemical pollution of the natural environment. He became one of the first scientists to personally obtain and analyze extensive experimental data on the dispersal and behaviour of radioactive products after nuclear weapon tests (1954-1974), after accidents at nuclear power installations (1957-1967), after the Chernobyl nuclear accident (1986-1996), and on transport of chemical products during operations of different enterprises (1970-1996). This experience permitted Professor Izrael to encourage and play his own part in the development, and then improvement, of transport models for both conservative and chemically active admixtures in the atmosphere and thus to develop methods of predicting the po

When I was doing a postdoc at Los Alamos in 1988, the thought that a book like this would be openly released by the Soviet Union was inconceivable. Many at the Lab would have derided the possibility. But of course the Soviet Union and the Cold War is no more. Still, if you came of age during those times, this book can still be jarring. The author was one of the top Soviet experts in monitoring and modelling fallout as a function of weather and geography and, it must be said and never forgotten, yield. Surely somewhere in the US Department of Energy archives must be comparable data on the US above ground nuclear tests (Nevada, Bikini, Eniwetok, Kwajalein). The

book largely looks at the Soviet counterpart, above ground detonations in Siberia. The text does not just put forth physical models (equations) for predicting fallout, but also experimental data from sensors deployed around the explosions. I surely do not speak metaphorically to suggest that the CIA would have sweated blood to get this Soviet data and analysis. Yet here it just presented all open for any reader. The data here, and any equivalent US data are likely to be the only data for some time, barring the re-opening of above ground tests, nuclear war, or meltdowns. While frustrating for some readers of an applied bent, others might be grateful for these circumstances not to advance this field of human knowledge. Of course, the author does not describe in any detail the manufacture or detonation methods. No nuclear power releases these. So please don't expect it in this book. The author was one of the most senior figures in the Soviet nuclear program. While perhaps not the equivalent of Oppenheimer or Fermi, but apparently of the rank immediately below. The text includes the civilian disaster at Chernobyl in the Ukraine, and other data from the 1990s.

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