

- 793 Pulmonary Effects from Radioactive Thallium-Activated Clay Particles. H. Cember, J. A. Watson, and T. B. Gruccl. Arch. Ind. Health 15, 449, 450 (May 1957).

In experiments designed to study the biological effects on the lungs due to point sources of radiation located within the pulmonary parenchyma, the solubility of the radioactive particle in the pleural fluids introduces a complicating factor. A stable and practically insoluble source of radiation was produced by adsorbing thallium-204 on montmorillonite clay and heating to 1000° C. Rats were intratracheally insufflated with an isotonic saline suspension of this preparation with a narrow size distribution over a number of months. Histologic examination of the tissue sections showed no damage that could be attributed to radiation. There was no difference between the control group and the exposed group. The distribution of the dose according to distance from the discrete particle is calculated. In this experiment, although the specific activity of the particles was low, it is significant that the chronic exposure in the immediate vicinity of the particle at a level about ten times greater than the maximum permissible daily dose rate produced no observable biologic damage.

- 794 A Clinical Study of Radiation Cataracts and the Relationship to Dose. G. R. Merriam and Elizabeth F. Focht. Am. J. Roentgenol. Radium Therapy 77, 759-783 (May 1957).

The dose of roentgen and gamma radiation to the lens has been measured for 100 cases with radiation cataracts and 73 cases which received radiation to the lens but did not develop cataracts. The probabilities of cataract for varied doses were calculated for single and divided treatments. The higher the dose for a given duration of treatment, the shorter is the time of appearance of the lens changes and the higher the incidence of progressive opacities. The lenses of children under one year of age are the most sensitive. The usual shielding methods are ample protection from roentgen rays of 100-140 kv. For higher voltages (200-250 kv.) 2 mm. of lead is usually sufficient. In the entire group of 100 radiation cataracts, it is estimated that by the use of current techniques the lens opacities could have been avoided in at least 80 cases. -- Cond. from authors' summary

- 795 Decontamination of Irradiated Uranium by a Fluoride Volatility Process. W. J. Mecham, R. C. Lilmatainen, R. W. Kessie, and W. E. Seefeldt. Chem. Eng. Progr. 53, 72F-77F (Feb. 1957).

A series of six pilot plant runs has been made on 10 kg. lots of uranium to demonstrate the decontamination of irradiated uranium by a process based on distillation of uranium hexafluoride. A rough distillation followed by a purification distillation gave a decontamination factor of the order of 10^6 for the uranium hexafluoride product.

-- Editor's summary

- 796 Engineering Aspects of the Disposal of Radioactive Wastes from the Peacetime Applications of Nuclear Technology. J. A. Lieberman. Am. J. Public Health 47, 345-351 (Mar. 1957).

The importance of developing safe methods of disposal of radioactive wastes is discussed. Present and possible disposal methods are described. Gaseous and airborne particulate wastes are being handled by methods that are described and as yet do not constitute a serious problem. The engineering of systems for handling and disposal of solid wastes has been relatively simple. Burial of such wastes under known, controlled conditions, and, in specific instances, disposal of sea have successfully and safely handled the problem, but problems will arise with expansion of the industry. Incineration of combustible solid wastes has been practiced to a limited extent. In the case of liquid wastes, it is important to distinguish between high-volume, low-level and low-volume, high level, wastes. The latter type constitutes the bulk of the engineering problem. The following methods are discussed: fixation in inert media, special separation of specific isotopes, and direct discharge to selected geologic formations. Each method presents a number of engineering problems. Other aspects discussed include site selection, administrative control, and changing technology.

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