

Third Pacific Area Meeting Papers

MATERIALS IN NUCLEAR
APPLICATIONS



Published by the
AMERICAN SOCIETY FOR TESTING MATERIALS
1916 Race St., Philadelphia 3, Pa.

ASTM Special Technical Publication No. 276

MATERIALS IN NUCLEAR APPLICATIONS

Symposium on Radiation Effects and Dosimetry
Symposium on Postirradiation Effects in Polymers
Papers on Industrial Water for Reactor Use
Symposium on Ceramics in Nuclear Energy

Presented at the
THIRD PACIFIC AREA NATIONAL MEETING
AMERICAN SOCIETY FOR TESTING MATERIALS
San Francisco, Calif., October 12, 14, 15, and 16, 1959



Reg. U. S. Pat. Off.

ASTM Special Technical Publication No. 276

Price \$8.25; to Members \$6.60

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Library of Congress Catalog Card Number: 60-14734

Printed in Baltimore, Md.
June, 1960

FOREWORD

Interest continues in radiation effects on all materials that come into contact with ionizing radiation, whether in nuclear reactors or at the higher altitudes reached by missiles and modern aircraft. Design engineers must know the changes in properties of metals, plastics, ceramics, and refractories before constructing reactors and accessory equipment. Also, there is a great emphasis on standardization of dosimetry units and techniques to facilitate the correlation of results obtained by engineers throughout the world.

To meet this need, three symposia presented at the Third Pacific Area National Meeting of the Society have been combined into one volume entitled "Materials in Nuclear Applications." The symposia included are: "Radiation Effects and Dosimetry," "Postirradiation Effects in Polymers," and "Ceramics in Nuclear Energy."

In addition to the papers presented at these three symposia, a paper by Lew F. Porter on "Radiation Effects in Steels" has been included in the Symposium on Radiation Effects and Dosimetry since it is, in effect, a comprehensive review of the literature on the subject. Also included in this volume are two papers presented at the Symposium on Technical Development in the Handling and Utilization of Water and Industrial Waste Water: "Disposal of Industrial Radioactive Waste Waters at Hanford," by L. C. Schwendiman, R. E. Brown, J. F. Honstead, C. E. Linderoth, and D. W. Pearce, and "Determination of Radioactive Materials in Water," by Franklin B. Barker.

The paper on "Radiation Effects Problems in Unmanned Nuclear Propelled Vehicles," by G. L. Stiehl, Jr., from the Symposium on Radiation Effects and Dosimetry, and the paper on "Beryllium Oxide for Nuclear Applications," by J. E. Hove, from the Symposium on Ceramics in Nuclear Energy, are not included in this publication.

The Symposium on Radiation Effects and Dosimetry, sponsored by Committee E-10 on Radioisotopes and Radiation Effects, was held during three sessions on Wednesday and Thursday, October 14 and 15. Messrs. V. P. Calkins, General Electric Co., and A. N. Holden, Vallecitos Atomic Laboratory, acted as Symposium Co-Chairmen. Messrs. D. W. McLenegan, Hanford Atomic Products Operation, and G. W. Pomeroy, General Electric Co., presided over the morning session on Wednesday, while Mr. C. R. Sutton, International Nickel Co., presided over the afternoon session. At the Thursday session Messrs. E. W. Gardiner, California Research Corp., and S. Wenk, Applied Radiation Corp., presided.

The Symposium on Postirradiation Effects in Polymers, sponsored by the Joint Subcommittee II on Effects of Nuclear and High Energy Radiation of Committees D-9 on Electrical Insulating Materials and D-20 on Plastics,

was held on Friday, October 16. Mr. Donald J. Metz, Brookhaven National Laboratory, acted as Symposium Chairman; Mr. T. K. Cleveland, Philadelphia Quartz Co. of California, and Mr. Metz presided over the session.

The Symposium on Ceramics in Nuclear Energy, sponsored by Committee C-21 on Ceramic Whitewares and Related Products, was held during two sessions on Monday, October 12. Mr. J. H. Handwerk, Argonne National Laboratory, acted as Symposium Chairman; Messrs. M. C. Poulsen, Port Costa Brick Works, and E. D. Lynch, Argonne National Laboratory, presided over the morning session, while Messrs. C. R. Sutton, International Nickel Co., and R. M. Fulrath, University of California, presided over the afternoon session.

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