NUCLEAR CHEMISTRY, THE NEUTRON AND ARTIFICIAL RADIOACTIVITY

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(1) INTRODUCTION

Nuclear chemistry is just a decade old, yet it is now the most active of all the special branches of science. Nuclear reactions are very similar to ordinary chemical reactions, except that they deal with matter which is a million million times more dense than ordinary matter, and on this account the forces are extremely high and the energies involved are a million times greater than those of ordinary atomic chemistry.

The purpose of this address is to outline some of the nuclear work done at the University of Chicago and especially to emphasize the point of view developed during the last few years, which is that only reactions of the chemical type occur among nuclei. Thus atoms may be artificially synthesized, but not artificially disintegrated.

Thus when two atomic nuclei meet they first combine to form a new nucleus, which on account of its large content of energy is unstable and therefore has a life which is short in large scale time, but not excessively short on a nuclear time scale. This intermediate product nucleus may then disintegrate in any one of a number of ways, which depend upon the nature and state of the metastable nucleus. Thus the disintegra-

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The American Association for the Advancement of Science:

Nuclear Chemistry, the Neutron and Artificial Radioactivity: PROFESSOR WILLIAM D. HARKINS 533

Obituary:

Charles Felmar Green: C. C. L. 543

Scientific Events:
The British National Human Heredity Committee; The Summer Symposium on Theoretical Physics at the University of Michigan; National Research Fellowships in Physics, Chemistry and Mathematics; Award of the Chandler Medal to Professor Giauque; In Honor of Professor Osborn; Award of the Two Hundred and Fifty Thousandth Bausch and Lomb Microscope to Professor Novy 543

Scientific Notes and News 547

Discussion:


Scientific Books:

Societies and Meetings:
The Southwestern Division of the American Association for the Advancement of Science: YEON C. KIRCH. The Minnesota Academy of Science: PROFESSOR H. K. WILSON. The Ohio Academy of Sciences: WILLIAM H. ALEXANDER 555

Reports:

Report of the President of the National Research Council of Canada 556

Special Articles:


Scientific Apparatus and Laboratory Methods:

Differential Staining of Thick Sections of Tissues: MADELINE KNEEBERG. A Convenient Resistance for Determination of Redox Potentials in Biological Fluids: MONROE E. FREEMAN 561

Science News 10

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