

A. DIVISION OF Nuclear Chemistry and Technology

(To be filled in by Division)

B. TITLE OF PAPER

Systematics of (x,x2p) Reactions for Production of Nuclei "Two Protons Removed from Stability."

Paper number as listed on program _____

Time Required for Presentation of Papers _____ minutes

C. AUTHORS

Underline name of speaker

R. Collé

D. Business Mailing Address Including Zip Code and Telephone Number

List address only once if all authors at same address

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E. ACS Member? **Division Member?**

☐ Yes ☒ Yes

☒ No ☐ No

F. American Chemist or Chemical Engineer?

If not, give classification such as biologist, physicist, etc. Ph.D?

☒ Chemist

☐ Chemical Engineer

Other _____

W. B. Walters

YES YES

W. H. Zoller

YES YES

W. R. Dodge

National Bureau of Standards
Washington, D.C. 20234

NO NO

G. Work done at University of Maryland & National Bureau of Standards

H. Plan ACS ___ **nonACS** ☒ **publication.** Where? _____ **No** ___ **Uncertain** ☒ ___

I. Specify Equipment Required for Presentation Other than 2"x2" or 3/4"x4" slide projector _____

J. ABSTRACT. 200 words or equivalent. TITLE OF PAPER, Authors' Names, Addresses with Zip Code. One-Line Space. Abstract. Single-space typing. Use *full width* of ruled area below.

SYSTEMATICS OF (x,x2p) REACTIONS FOR PRODUCTION OF NUCLEI "TWO PROTONS REMOVED FROM STABILITY."* R. Collé, W. B. Walters, and W. H. Zoller, Department of Chemistry, University of Maryland, College Park, Md. 20742 and W. R. Dodge, National Bureau of Standards, Washington, D.C. 20234

In recent years, considerable effort by a number of laboratories has been made in searching for new neutron-rich isotopes ("two protons removed from stability"). This work has lead to the discovery of ^{184}Hf , ^{206}Hg and ^{236}Th as well as intense searches for the still undiscovered ^{62}Fe , ^{186}Os and ^{190}W . Although (p,3p) and (γ ,2p) reactions are usually employed, these neutron-rich nuclei can also be produced by (n,n'2p) reactions utilizing the fast neutron spectra accompanying the stopping of high energy proton beams in solid stops. We have undertaken a systematic study of these (x,x2p) reactions for incident protons, bremsstrahlung and fast neutrons because of the scarcity of production data for them. Radiochemically determined cross sections for production of (p,3pxn) products and integral atom yields for the neutron-induced and photonuclear reactions are reported for a wide range of target masses at selected incident beam energies (≤ 100 -MeV). Systematics as a function of target mass and the relative distributions of neutron-deficient vs. neutron-rich products are discussed.

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