

CERN LIBRARIES, GENEVA



CM-P00043214

Proposal to the Physics-III Committee at CERN, Geneva

c.o. Dr.F.Herz, Secretary of the Physics-III Committee

The Possible Production of Superheavy Elements in the Interaction of  
High-Energy Protons with Tantalum.

K.Baechmann, et al.

Lehrstuhl fuer Kernchemie, Technische Hochschule, Darmstadt

R.Frandt, P.Laubereau, and P.Patzelt

Institut fuer Kernchemie, Universitaet, Marburg

Recently, Marinov, et al.<sup>1)</sup> claimed to have found evidence for the production of eca-mercury (Z=112) in the interaction of High-energy protons with a tungsten target. It is obvious, that such an experiment should be reproduced by other groups and we would like to work on such a project. However, instead of tungsten we would prefer to use a tantalum-target. Both elements are neighboring in the periodic table of elements, so it is reasonable to assume that both elements are equally well suited for the possible production of superheavy elements. The contamination of tantalum with respect to uranium should be considerable lower <sup>than</sup> in tungsten because of chemical similarities of tungsten and uranium. High-energy protons produce in uranium alpha-emitting spallation products which could interfere with the identification of possible superheavy elements.

Irradiation details: We suggest a tantalum-target, 7mm in diameter and 8cm in length, canned in an aluminium box, as a production target in the slow-extracted proton beam in the "east area" for one experimental PS-period up to three weeks.

Identification: The actinides, Pt, Au, Hg, Tl, Pb, and Bi are chemically separated by very refined procedures. Each fraction shall be counted for alpha and spontaneous fission activities. In case of positive evidence further purifications and elemental separations would be pursued. Proportional counters and semiconductor solid-state detectors are available for both alpha and fission counting, mica for fission fragment identification.

1) Marinov, et al, Nature, Febr. 1970