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HANFORD ATOMIC PRODUCTS OPERATION

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FROM: A. M. Platt and G. R. Kiel

TRIP REPORT - UNIVERSITY OF CALIFORNIA RADIATION
LABORATORIES

SPECIAL RE-REVIEW
FINAL DETERMINATION
DECLASSIFICATION CONFIRMED

BY JP Dercum DATE 6-8-81
BY Jw Jordan DATE 6-9-81

Separations Technology Sub-Section
Technical Section, Engineering Department

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TRIP REPORT - UNIVERSITY OF CALIFORNIA RADIATION
LABORATORIES

On September 17 and 18, discussions were held at the University of California Radiation Laboratories to review any developments of interest to the Separations Technology Sub-Section. Conferences were held with I. Perlman, S. G. Johnson, K. Street, W. McVey, and K. Huett.

The following is a resume of the more important points discussed. More complete data are available for the information of any interested personnel.

1. There are indications that HAPO might be requested to produce a small amount of americium. Three possible methods of producing americium were suggested. These methods are as follows:
 - a) Present production may be subjected to a suitable decay period in order to allow Pu^{241} to decay to Am.
 - b) Plutonium cast in appropriate shapes may be subjected to further pile irradiation. Such irradiation will produce Am.
 - c) The Am content of old weapon shapes may be isolated and the plutonium recast.

It is thought that any overtures on this matter will probably originate in the San Francisco A.E.C. office.

2. The Zr-Nb decontamination problem in the Redox plants was discussed at some length. It was suggested that the addition of a trace of fluosilicic acid or HF might improve the decontamination. The effects of such compounds on emulsion problems and/or Pu behavior were not stated.
3. It was indicated that cost figures now used at UCRL show Pu to be about five times as expensive as U_{235} on a gram basis. The authors stated that this ratio was probably high for current production, with a three to one ratio probably more applicable, although the five to one ratio might be correct for the construction of new facilities.
4. Some preliminary experiments have been made at Livermore on a TBP RA Column flowsheet where all the acid is added in the extractant. Such a flowsheet indicated improved uranium performance. No data were available on the behavior of fission products.
5. Experiments on the dissolution of Zr-U alloys using HF-HNO₃ mixtures showed definite explosive tendencies in all containers except those constructed of platinum or gold.

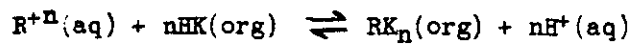
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6. Equilibrium coefficients for the reaction of various cations with chelates were stated to be of the following magnitudes.



<u>Equil. Const.</u>	<u>Cation</u>
10^8	Zr^{+4}
10^6	Pu^{+4}
10	Mn^{+4}
10^{-5}	Pu^{+3}
10^{-10}	Ba^{+2}

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