Report No. AECD-2950	Part	Ref. Report No's. LADC-739	S	C	O	U	D	Date of Doc. X n.d.	Date Rec'd. 2/2/50	Prod. Order No. 471	NSA ABSTRACT AND INDEX RECORD AEC FORM NO.
Author(s) L. B. Asprey, S. E. Stephanou, and R. A. Penneman			RET. DATE Loan: ☒ Mark ☐ No ☐		Price	Distr.	Priority	Spec'l	1-X		
Title A NEW VALENCE STATE OF AMERICIUM, Am(VI).								Publ. Rec'd ☒ Asked ☐ Rel. ☐ Form ☐	Manu. Pages 2		
Orig. Agency Los Alamos Scientific Laboratory				Credit, Contract & Account No. USAEC						No. of Tables Folia Photos	
Copies Rec'd 1	Series & Copy No(s)		Book Pages	Copies to Run	No. Up	Impressions		Total			
ABSTRACT											
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<p>This document is reproduced in its entirety.</p> <p>The following evidence has been obtained for the existence of americium in the formal valence of plus six; (1) Americium(III) is completely oxidized by ammonium peroxydisulfate in 0.2M nitric or perchloric acids to a nonfluoride-precipitable state. At a concentration of 200 μg of element per 100 microliters (2 g/l), the characteristic pink of Am(III) changes to a strong yellow color. (2) The absorption spectrum of such an oxidized solution was measured with a Beckman model DU spectrophotometer using quartz micro cells and 0.1 sensitivity scale. The solution shows no Am(III) absorption at 504 and 811 $m\mu$, or Am(V) absorption at 514 and 714 $m\mu$. There is a narrow and prominent peak at 991-992 $m\mu$, and strong</p>											
SUBJECT HEADINGS (con'd on 2nd sheet)								SUBJ. CODE	SELECTOR NO.		
I. Americium - Valency.											
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III. Stephanou, S. E.											
IV. Los Alamos Scientific Laboratory.											
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ultra violet absorption. The decrease with time of these new absorption peaks is attended by a growth of Am(V) absorption but no increase in the Am(III) absorption. The rate of decrease of the 991 peak is much greater in the absence of sulfate, and the ultra violet absorption is altered. (3) By the addition of sodium acetate, a yellow compound of tetrahedral structure was obtained which was isomorphous with the analogous NaMOAc_3 compounds (M is U or Pu). The refractive index of sodium americyl acetate has the expected value of 1.528 (compared with 1.501 and 1.518 for the uranium and plutonium compounds, respectively). There were no Am(III) or Am(V) absorption lines in this compound. The compound was dried with acetone, treated with excess ferrous ammonium sulfate and back-titrated with ceric sulfate. The amount of americium was determined by radio-assay. A value of 2.9 was obtained for the number of equivalents on reducing Am(VI) to Am(III). (4) X-ray analysis showed a cubic structure with an a_0 of 10.6 which is the same as that of the uranium and plutonium analogs. (5) Ether extraction after removal of sulfate with barium and salting with ammonium nitrate and nitric acid gave essentially complete extraction. (6) Hexone (methyl isobutyl ketone) was also successful, but less complete, apparently ^{owing} ~~due~~ to reduction by the solvent. (7) Addition of sulfuric acid (sufficient to make 4M H_2SO_4) to a solution of Am(V) in 0.3M HClO_4 caused rapid disappearance of Am(V) absorption which was accompanied by a rapid growth of the 991 peak (Am(VI)) and Am(III) absorption. Insufficient evidence has been accumulated to establish whether this disproportionation gives Am(IV) in observable amounts.

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