PRNC029

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PUERTO RICO NUCLEAR CENTER

DISTRIBUTION OF RADIOACTIVE ANTIMONY

FORMED BY NEUTRON CAPTURE IN

ANTIMONY COMPOUNDS

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[OPERATED BY UNIVERSITY OF PUERTO RICO UNDER CONTRACT

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DISTRIBUTION OF RADIOACTIVE ANTIMONY FORMED BY NEUTRON CAPTURE IN ANTIMONY COMPOUNDS:

J.-F. Facern?

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Revo 28 Oetaber 192; in red fom 30 Decne 1962)

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percentage tadince Se) oat biel yoke workersei aren oe

?Tu results of several other workers on the distribution ofthe radiontive arsenic, formed bythe (2,9) processes on arvenic oxides, indicate the importance of carrying ?out similar studies with antimony oxides.

"Antimony, having similar properties to arsenic forms three oxides commonly writen as Sb{0s, S00, and 8b,0,. The iradiation of antimony gives the radio-iotopes "25b and Sb, of known characteristics.

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1 A. © Manno and M. Mo MAD. Cond J. Chem. 34 4 (1950.

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?Table | shows the dsirioution of the radioactive F486 and "Sb as SHIM) and

suv},

?The yield of 64V) in both sompics of radiated antimony penton was the same

and showed no apparent let oftheir dierent srucures. The distribution of 35

and Sb inthe pentavalont states essentially the same for ll he compounds studied,

?within the experimental eros. No isotopic eects found in the chemical sate ofthe

?mo radioactive species. in agreement with Ue published data

'No difeence exists between samples procesced immeditely oF 24 hr after iradi-

tion. Therefore, the isomers tansiton "Sb 7, 21 min prestmably does not being

bout an increase in the yield ofthe higher oxidation sate

?The resulis for $b,0y showed nearly 99 percent retention in agrement with

Previously publsied data." Retention in S0,0, was lw and the yield ofthe pent

?alent sate in $6.0, was that expected for an equimolar mixture of 8,0, snd 80,0,,

1 Pau J nr, Chom Si. $8, 1895 93,

IN V.Siocwict. The Chemie! Eto hr Compaen Vo... 78, Oxford (980,

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?The fasion with KOH (at 30°C) apparently didnot change the distribution between the two valence states as ay bese from the results of dissclving Sb,O, in concen: trated HCL. Te fellows tht he majority of the radioactive Sh ators reach thee final ?nidation stats in the eysal ates iumedtelyaer the nuclear proces or posibly a Short tins aflce Me practice has ost is Ainetic energy In terms of scaling, the fact tha teres ne ehsage i the eintion may be dc to the short time atthe high femperature inthe rel In addon, reaction between the sample and solvent must,

iso be conse ine his ean snpede the recombination of recoil atoms with the rye weageie=~ The neutral i a rapid reaction. in addition the high oncentistcn of OI! in the fos! KOH, wil aeceierate lace degradation, vit the {ntermediate formation of polyanionic complexes" It must also be remembered that the vacenees ecour edit sis inthe itraisted compounds,

?The results for preteited samples of KSMOW), suggest dat the presence of the (OH group in the iraduted monctle ads to a greater yet ofthe higher oxidation ?states The low yielt in cane (A) on be attributed to te los of water from the com pound. ?Tho rolls in ave (C) sve i agreement with those recently published.

has been suggested that a linea relation exsts between the yield of pentavalent tadigactie aver athe tno xype atoms 1 arsenic aims in the compound irradia with neutrons." sina felon seems to hold forthe radioactive Pentavalout antimony forme! inthe ?vradation of simple antimony compounds {Gee Fig. 1). Thi cay, a i the sida cass of radioactive arsenic, mdicaes that

3.4 Atv T, Mowat e219 U9)

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{he oxygen content ofthe compound is the main factor n determining the distribution

?of the raioactve antimony between the and pentavalent states significant fact

?as thatthe results for KSH(OH, submited to pretreatment (A) fall othe linear

?elation at point coreesponing tothe hypothetea! KStO,,

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?Mansi wo indy performed the Xrsy mesurencts nd Dr 0. , Wratiset he PRN,

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