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NOTES

Preparation of neptunium targets by electrodeposition

(*Received* 8 *January* 1962; *in revised form* 9 *April* 1962)

NEPTUNIUM has been coated on metal cathodes by the electrolytic deposition of the oxide or hydroxide. The experimental results show that adherent, uniform neptunium sources can be prepared in the range from 0·2 to 4 mg on a nickel cathode area of 7 cm². Heavier neptunium sources in the range 0·8–7 mg were also prepared after several successive electrodeposition steps on the same disc. Platinum, stainless steel and tantalum backing discs were found equally suitable for the sources. The electrolytic cell consisted of a polyethylene cylinder and base cap, a nickel plated disc serving as cathode contact, and a platinum ring anode. The cell was kept at 80°C in a water bath, with constant stirring at about 100 rev/min. The cathode discs were treated with carbon tetrachloride and chemically etched immediately before plating. To an electrolyte volume of 15 ml of saturated ammonium oxalate solution, 25–500 μl of 0·5 M HNO_3 neptunium solution were added and the pH of the resulting solution adjusted to 7 with ammonium hydroxide. Current densities of 0·043–0·057 A/cm² were used in most experiments. At the end of the electrolysis the metal hydroxide deposits were rinsed with distilled water and dried at room temperature. The plate uniformity was determined by means of autoradiographs and densitometic measurements. The maximum density difference ratio {MDDR: (Maximum optical density/Minimum optical density) − 1} varied from 0·16 to 0·40 with an average ratio of 0·28.

Acknowledgements—This investigation has been carried out as part of the programme of the Foundation for the Fundamental Research of Matter (F.O.M.) with the financial support of the Organization for Pure Research (Z.W.O.). Thanks are due to the International Atomic Energy Agency for a fellowship and to the Comisión Nacional de Energía Atómica for giving the necessary leave of absence.

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Alkylammonium complexes of copper (II)

(*Received* 24 *April* 1962)

THE reaction of copper (II) chloride with amine hydrochlorides to form yellow bis-alkylammonium tetrachlorocuprates (II) has been reported previously.[1,2,3]

As part of another study, we attempted to prepare alkyl diazonium chlorides at low temperatures. We observed, however, that methylamine and ethylamine, in the presence of liquid anhydrous HCl and $CuCl_2$, gave the known[3] corresponding bis-alkylammonium tetrachlorocuprate (II), $(RNH_3^+)_2(CuCl_4^=)$, R = Me and Et.

We found that these complexes are extremely soluble in N-methylpyrrolidone and slightly soluble in γ-butyrolactone, but are precipitated from these solutions on addition of diethyl ether.

The ultraviolet and visible absorption spectra of the two complexes were measured in several solvents and, as reported previously (but without supporting data)[3], we have observed that the results are strongly dependent on the nature of the solvent.

Thus, both complexes exhibited maxima at 475 mμ (ϵ 1500, R = Et) and 316 mμ (ϵ 3570, R = Et) in γ-butyrolactone. The bis-ethylammoniumtetrachlorocuprate (II) (compound A) exhibited maxima at 474 mμ and 344 mμ in acetone and only at 273 mμ in methanol.

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