

Experimental

It has been found that the precipitation of lanthanum hydroxide or ferric hydroxide in basic solutions ranging in pH from those generally obtained with buffered ammonia solutions (pH ~8.5) to those obtained with strong bases (pH ~14) resulted in complete carrying of elements 99 and 100 provided very high salt concentrations and the presence of organic complexing agents such as citrate or lactate were avoided. Elements 99 and 100 were well carried by rare earth fluorides precipitated from either nitric or hydrochloric acid solutions if the conditions produced the complete precipitation of the rare earths themselves. Alternation between hydrochloric and nitric acids in fluoride precipitations was effective in the separation of combinations of certain elements such as ruthenium, lead and magnesium. One useful method of dissolving fluoride precipitates was to use saturated boric acid together with hydrochloric or nitric acid, following which the hydroxides could be precipitated with ammonium hydroxide. The hydroxides were dissolved by blowing hydrogen chloride gas over them. The solution thus obtained could be transferred directly to an ion exchange column. In the operation of Dowex 50 cation resin columns, using alcoholic hydrochloric acid as eluant, to obtain a group separation of the actinide and lanthanide elements, it was frequently useful to place a 2mm. thick bed of Dowex 1 anion resin at the bottom of the Dowex 50 bed to remove those impurities which form strong anionic complexes (such as iron). Fractions of interest (usually obtained by combining