

thickness of this foil was changed to vary the energy of the particles (initial energy ~ 40 Mev). The duralumin foils reduced the energy to ~ 37 Mev and the 0.5-mil platinum foil further reduced it to ~ 35 Mev. This platinum foil also served to reduce the spread of radioactivity through the evacuated compartment. The back of the platinum dish containing the sample was cooled directly with a water jet. The intensity of the beam of helium ions striking the sample was determined by measuring the charge accumulated on the insulated target dish and foil. The energies of the helium ions were calculated as ranging from 30 to 35 Mev in various bombardments. (The intensity of the bombardments averaged about 2 microamperes per sq cm and the time of bombardment was usually about 6 hours.)

Chemical Procedure

Following the bombardments, the platinum dish containing the sample was removed to a gloved box (illustrated in Fig. 2) and the americium oxide dissolved in $6M$ nitric acid with heating ($\sim 75^{\circ}C$). Americium hydroxide was precipitated with the addition of excess ammonium hydroxide and separated by centrifugation. The hydroxide was dissolved in dilute ($0.1M$) HNO_3 , the solution was made $0.2M$ in ammonium persulfate and $0.2M$ in ammonium sulfate and the americium converted to the hexapositive (fluoride-soluble) oxidation state by heating (in the case of the best results) for about 1-1/2 hours at $75^{\circ}C$. The major part of the americium was separated early in this manner in order to reduce the bulk of material with the berkelium and make possible the use of resin columns of smaller diameter. Although not absolutely necessary, this improves the sharpness and speed of the chemical separations. Unoxidized americium was precipitated by the addition of hydrofluoric acid ($3M$), the insoluble americium (III) fluoride carrying with it curium, element 97, and some - mostly rare earth - fission products. The fluoride precipitate was converted to a hydroxide by treatment with $6M$ KOH followed by centrifuging and washing. The hydroxide precipitate was