

element 97 as the basis for his thesis research problem, and the further collaboration of Albert Ghiorso was also sought. Many problems had to be solved, mostly in connection with the small amounts of material available for irradiation and the intense radioactivity of this material. To help counterbalance the many difficulties were the advances which had been made in the possibility of predicting the radioactive properties of the expected isotopes and especially the exact predictions of the chemical properties made possible on the basis of the actinide concept. According to this view, the elution positions of the transcurium elements should be analogous to those of the transgadolinium elements in the ion exchange column separation method. This knowledge proved of inestimable benefit in planning the ultimately successful experiments. Two approaches to the problem were undertaken: namely, that of neutron irradiation in the chain reacting piles and that of charged particle bombardment in the 60-inch cyclotron. The difficulties attending the neutron irradiation are illustrated in the following slide (Figure 13).

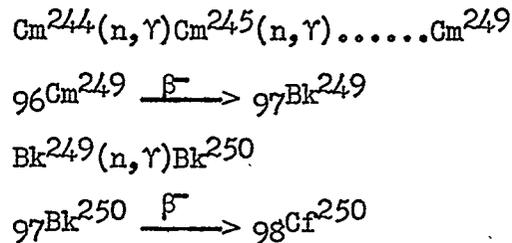


Figure 13

The prediction that curium must have a mass number as high as 249 before a negative beta particle emitter is reached is based on considerations involving the nuclear energy surface and the systematics of radioactivity