

experiments:

(1) The activity coprecipitates with rare-earth fluorides from strongly oxidizing solutions, such as 0.1 M $K_2Cr_2O_7$ in 1 M HNO_3 solution, and Ag^{++} with $(NH_4)_2S_2O_8$ in 2 M HNO_3 solution. Those elements, without regard to the plausibility of their formation in the nuclear processes described, which are not eliminated from consideration on the basis of this are: scandium, yttrium, indium, lanthanum, the rare-earth elements, actinium, thorium and possibly protactinium and thallium.

(2) Among the more logical possible alpha particle emitters to be considered, we may eliminate thallium, lead, bismuth and polonium by consideration of the fact that the activity does not coprecipitate with bismuth sulfide from 0.25 N HCl solution.

(3) Thorium peroxide does not carry the activity, under conditions in which thorium precipitates quantitatively, thus eliminating thorium.

(4) Actinium tracer activity and the activity in question may be fractionated by coprecipitation with zirconium or ceric iodate from 0.035 M potassium iodate - 1 N HNO_3 solution, the actinium tracer carrying to a greater extent.

(5) The activity may be separated from tracer or macro amounts of the rare-earth elements by the precipitation of a lanthanum compound of undetermined composition from 1 M ammonium fluosilicate - 5 M HNO_3 solution. The alpha activity remains largely in solution while the rare-earth elements are almost completely precipitated under these conditions.

(6) The activity may be separated from curium activity by selective elution with ammonium citrate solution from columns of resin, such as Amberlite IR-1, or Malsite (Dowex-50). Curium is removed more easily.

This chemical evidence, with the nuclear evidence previously given, establishes beyond any reasonable doubt that the activity is due to an actinium-like transplutonium element, americium.