

Gross alpha/beta: thick source method

Solids

A sub sample is finely ground. A known mass is spread as an even layer on a stainless steel planchet with the help of a dilute solution of adhesive alcohol. The solvent is removed by evaporation and the planchet is then counted on a Berthold LB770 or Protean MPC9604 low background gas proportional counter. The counter is calibrated with americium-241 or plutonium-239 for gross alpha determination and potassium-40 or caesium-137 for gross beta determination.

Liquids

The sample is concentrated by evaporation and sulphuric acid added. The resulting residue is heated in a furnace and then finely ground. A known mass is spread as an even layer on a stainless steel planchet with the help of a dilute solution of adhesive in industrial alcohol. The solvent is removed by evaporation and the planchet is then counted on a Berthold LB770 or Protean MPC9604 low background gas proportional counter. The counter is calibrated with americium-241 or plutonium-239 for gross alpha determination and potassium-40 or caesium-137 for gross beta determination.

Filter

The filter is spread evenly on a stainless steel planchet. The planchet is counted on a Berthold LB770 or Protean MPC9604 low background gas proportional counter; the alpha and beta count rates being recorded. The counter is calibrated with americium-241 or plutonium-239 for gross alpha determination and potassium-40 or caesium-137 for gross beta determination.

Ashed Material

The sample was ashed at a temperature of 300°C. A known mass of the ashed material was distributed on a planchet to produce a 'thick source', which was then measured on a gas proportional counter. The counter is calibrated with americium-241 or plutonium-239 for gross alpha determination and potassium-40 or caesium-137 for gross beta determination. The sample mass used was corrected back to the pre-ashed weight and is therefore expressed as the activity per gram of the sample received.