June 1967

Brief 67-10194

AEC-NASA TECH BRIEF

AEC-NASA Tech Briefs describe innovations resulting from the research and development program of the U.S. AEC or from AEC-NASA interagency efforts. They are issued to encourage commercial application. Tech Briefs are published by NASA and may be purchased, at 15 cents each, from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Separation Technique Provides Rapid Quantitative Determination of Cesium-137 in Irradiated Nuclear Fuel

The problem:

To develop a technique for determining cesium-137 activity in fuel samples which had been irradiated for 30 minutes or less and which had decayed for periods of less than 2 months prior to analysis. This information was required in the testing of a nuclear rocket reactor which uses fuel contained in a graphite matrix. Standard techniques were tedious and time consuming, and in many cases, inaccurate.

The solution:

Use potassium cobalt ferrocyanide to preferentially remove cesium from an acid solution of the fuel material.

How it's done:

An acid solution of the fuel material containing fission products is prepared and milligram quantities of potassium cobalt ferrocyanide are added. The ferrocyanide preferentially selects the cesium, and the residue is subsequently filtered and analyzed with a gamma spectrometer. The separation is quantitative.

The procedure requires less than 30 minutes and gives excellent separation from other fission products. It has been used to determine the fissions in reactor fuel even though reactor operating times are of only several minute durations, and from which relatively small amounts of cesium are generated.

Note:

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
AEC–NASA Space Nuclear Propulsion Office
U.S. Atomic Energy Commission
Washington, D.C. 20545
Reference: B67-10194

Patent status:

No patent action is contemplated by AEC or NASA.

Source: J. J. McCown and E. J. Ellenburg
of Westinghouse Astronuclear Laboratory
under contract to
AEC–NASA Space Nuclear
Propulsion Office
(NUC-10047)

Category 03