

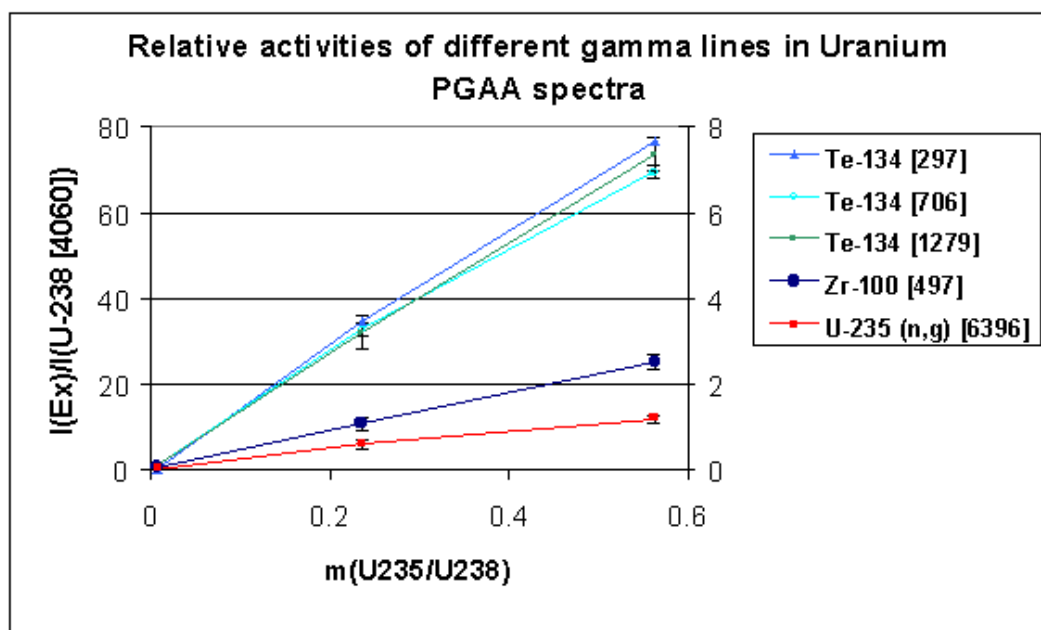
B N C Experimental Report	<i>Experiment title</i> Non-destructive determination of $^{235}\text{U}/^{238}\text{U}$ isotope ratio by PGAA	<i>Proposal No.</i> <i>Local contact</i> Zsolt Révay
	<i>Principal proposer:</i> G. L. Molnár, Institute of Isotope and Surface Chemistry, CRC Budapest <i>Experimental team:</i> Zs. Révay, T. Belgya, G. L. Molnár Institute of Isotope and Surface Chemistry CRC Budapest, H-1525	<i>Date(s) of Exp.</i> 1998 <i>Date of Report</i> 20-Dec-99

Objectives

To develop a non-destructive method to determine the isotopic enrichment of uranium.

Results

A non-destructive method has been developed to determine the $^{235}\text{U}/^{238}\text{U}$ ratio in materials containing uranium as a major element. Three uranium-oxide (U_3O_8) samples have been irradiated: one of them had natural isotopic composition, and two were enriched to 19.1% and 36% ^{235}U content, respectively. Intensities of prompt-gamma lines from $^{235}\text{U}(n,\gamma)$ reaction and from some fission products have been compared to the intensity of a high energy line from the $^{238}\text{U}(n,\gamma)$ reaction, and a linear correlation has been found. Hence, PGAA is suitable for rapid and non-destructive determination of the enrichment of uranium samples.



References

Zsolt Révay, Gábor Molnár, Tamás Belgya, ?szi Radiokémiai Napok, Paks, 1998, talk

Future prospects

A detailed examination of ^{235}U prompt gamma-ray spectrum and γ - γ coincidences are planned.