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## DETERMINATION OF LANTHANIDES IN PHOSPHATE ROCKS BY INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS

Awad Hamdy Ahmed Mohamed<sup>1</sup>, Zakaly Hesam M.H.<sup>1</sup>,  
El Taher Atef<sup>3</sup>, Sebak M.A.<sup>4</sup>

<sup>1</sup>) Southern Federal University, 344103, Rostov-on-Don, Zorge St., 40, Russia

<sup>2</sup>) Institute of Physics and Technology, Ural Federal University,  
Yekaterinburg, Russia.

<sup>3</sup>) Physics Department, Faculty of Science, Al-Azhar University,  
Assuit Branch, Assuit, Egypt.

<sup>4</sup>) Physics Department, Collage of Science and Arts, Jouf University,  
Al Qurayat Branch, KSA

E-mail: [hamdiawaad@gmail.com](mailto:hamdiawaad@gmail.com)

Neutron activation analysis is the most used analytical technique for the determination of the rare-earth elements in geological matrices on account of its high sensitivity, of the possibility of determining all the elements and of the undisputed accuracy and reliability of its results.

The application of instrumental neutron activation analysis for the determination of long-lived rare earth elements (REE) in rock samples is considered in this work. The rare earth elements (REE) form the largest chemically coherent group in the periodic table. The versatility and specificity of the REE have given them a level of technological, environmental, and economic importance considerably greater than might be expected. The objective of this work was to determine the concentration of rare earth elements in phosphate samples from Egypt and Saudi Arabia, using both instrumental neutron activation analysis (INAA). The samples were prepared together with standard reference material and simultaneously irradiated in a neutron flux of  $7 \times 10^{12} \text{ n.cm}^{-2} \text{ s}^{-1}$  at ACTLAB activation laboratories Canada. Irradiated samples were measured using gamma-ray spectrometer based on HPGe detector. The choice of the nuclear reaction, irradiation and decay times and of the proper gamma ray measurement to determine the concentrations are presented and discussed. The Instrumental neutron activation analysis proved to be the more precise method for a wide range of REE contents and can be recommended for routine practice.

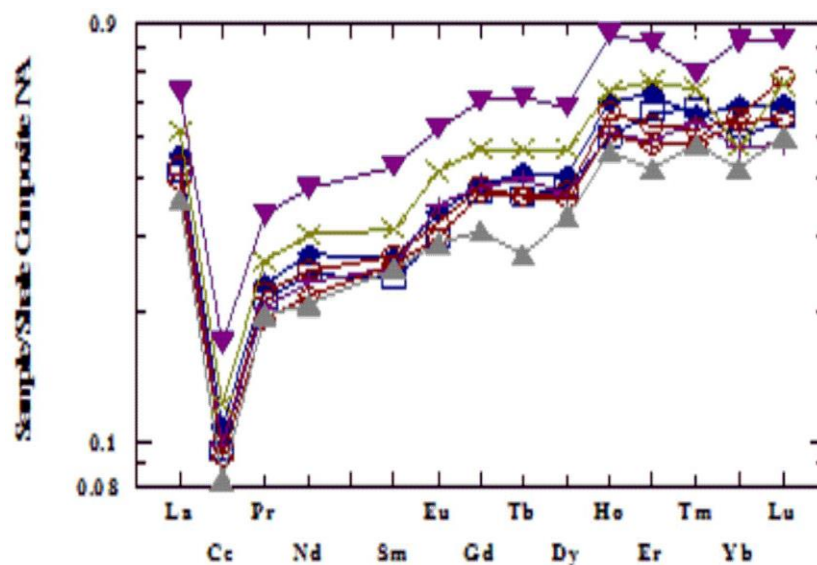


Fig. 1. The REEs concentration in Hazm Al-Jalamid phosphate samples normalized to the North American shale composite (NASC)

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