

Experience with Delayed- and Prompt-Gamma Neutron Activation Analysis using Accelerator-based neutrons at KFUPM: An overview

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A valuable method for figuring out the concentrations of various elements in natural materials, either online or in situ, without changing their chemical forms in the matter, is the prompt gamma-ray neutron activation analysis (PGNAA). The current study illustrates three different techniques that have been adopted at KFUPM that sought the yield of PGNAA systems that records gamma rays from neutron inelastic scatterings and neutron thermal capture reactions. These techniques are portable neutron generators (DD-reaction), Am-Be source, and neutron accelerator (DT-reaction). This work will clarify the advantages and disadvantages of each system and the improvement of each one to measure the minimum detectable concentrations (MDC) of heavy contaminants in environmental samples. Results and comparisons will be discussed.

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