

USE OF CITATION CODE FOR FLUX CALCULATION IN NEUTRON ACTIVATION ANALYSIS WITH VOLUMINOUS SAMPLE USING AN Am-Be SOURCE

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The CITATION code based on neutron diffusion theory is used for flux calculations inside voluminous sample in prompt gamma activation analysis with an isotopic neutron source (Am-Be). The code use the specific parameters related to energy spectrum source, irradiation system materials (shielding, reflector). The flux distribution (thermal and fast) was calculated on three-dimensional geometry for the system: air, polyethylene and water cuboidal sample (50x50x50 cm). Thermal flux was calculated in series of points inside the sample, and agreed with results obtained by measurements with good statistical uncertainty. The maximum thermal flux was measured at distance 3.2 cm and calculated at 3.7 cm by CITATION code. Beyond a depth of 7.2 cm, the ratio thermal flux over fast flux increases until twice and allows us to optimise the detection system position in the scope of in-situ PGAA.