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Database for thermal neutron induced prompt gamma rays

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Prompt Gamma Activation Analysis (PGAA) is based on the detection and analysis of gamma rays induced by neutron capture. This versatile nuclear analytical technique started propagating after the 1990s not just because of the difficulties of the spectrum evaluation, but also due to the lack of the proper analytical database. The first comprehensive spectroscopy database with the ambition of reliably supporting chemical analysis for all naturally occurring elements was published in 2004—2007 based on the measurements performed at Budapest. It contains energy and partial gamma-ray production cross section data for all stable elements for 25-100 strongest lines derived from spectra of pure elements, calibrated using stoichiometric compounds and special mixtures. Using this database, an analytical method was also developed to determine the composition from the PGAA spectra. After 20 years of minor upgrades in both the database and the analytical method, the database is ti be upgrade based on the new measurements in FRM2's strong cold beam with improved statistic. Besides chemical analysis, the collection of spectra together with the capture-gamma database can be used for many other purposes in the field of nuclear science and industry, e.g. for shielding calculations, nuclear physics etc.

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