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Spectroscopy data library for prompt gamma activation analysis

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The establishment of the spectroscopy data library for prompt gamma activation analysis (PGAA) was initiated 25 years ago, as no reliable (n,gamma) database existed for analytical purposes. The database lists partial cross sections and peak energies of elements used in chemical analysis. The first versions were published in [1], also in IAEA TECDOC, and has been used worldwide. More than 20,000 samples were successfully analyzed with it in our labs. The database has been continuously improved with targeted measurements.
The project was relaunched at the Garching reactor in 2011, where the beam is much stronger allowing for the use of thinner and smaller samples. Thus, the systematic errors from self-attenuation and random coincidences could be eliminated. The whole periodic table is being remeasured in elemental and compound form. Until the last cycle, the project reached about 80% completeness and it needs about 20 more beam days. Last year, the database had a major update: the ambiguous peaks have been deleted, many standardizations were improved based on measurements of high-quality stoichiometric compounds, which were not yet available 20–25 years ago. The evaluation is in progress. The final version is invited to be published in Atomic Data Nuclear Data Tables.
[1]Zs. Révay, R.B. Firestone, T. Belgya, G.L. Molnár: Prompt Gamma-ray Spectrum Catalog, in: Handbook of Prompt Gamma Activation Analysis with Neutron Beams, (G.L. Molnár ed.), Kluwer, Dordrecht, 2004, pp.173–364.

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