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Chemical analysis with Neutrons at the MLZ

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Having no charge, neutrons can easily penetrate the atomic nuclei. The characteristic radiadion of the actication products is ideal for the non-destructive determination of the elemental composition.At MLZ, neutrons are used for chemical analyses in various ways. We present an overview of the different methods regarding their advantages, limitaions and applications. The focus is on the "classic" methods Prompt Gamma Activation Analysis (PGAA) and Neutron Activation Analysis (NAA). PGAA and NAA are complementary and allow for the determination of the concentrations for almost all chemical elements in many different kinds of samples. Further techniques are for instance Neutron Depth Profiling (NDP), Prompt Gamma Activation Imaging + Neutron Tomography (PGAI/NT) and Fast Neutron induced Gamma Spectrometry (FaNGaS).

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