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Neutron activation analysis (NAA) for the materials investigation: from high-temperature gas turbine to micro electronics

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eutron activation analysis is a very sensitive method to determine main, minor and trace elements in materials. The FRM II offers a series of irradiation facilities with different neutron fluxes and properties for the multi-elements analysis. The presentation will introduce some projects to demonstrate the diverse applications of NAA.

Manufacturing of special alloys for the new generation of high-temperature gas turbines is a current research area. The concentration of components is determined by using NAA in some Co-Ta-alloy samples. Due to the high density of such materials, the gamma-ray Gamma ray attenuation during the gamma-counting should be corrected. A new practical method using internal standards is developed for the calculation of the detector efficiency curve.

The micro electronic industry requires more and more high purity silicon materials. Trace elements with concentrations lower than 1 ppb (10E-9) can be determined using NAA after long time irradiations in high flux neutron field. Analysis of tail material of Si crystal after float-zoning process can give a new quality control method of semi-conductor starting materials.

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