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Testing of materials for nuclear physics experiments

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The materials used in nuclear physics experiments are of interest for two aspects: the behaviour in time (degradation and ageing of materials used in the construction of the nuclear facilities) and the purity of the materials used in certain experiments. A large number of testing methods are currently available, with different degrees of standardization. The physics and chemistry testing laboratory from IRASM Department of IFIN-HH performs radiation-hardness testing and characterization of materials: thermal analysis (TG/DSC), mechanical testing, chromatography (GC-MS), vibrational spectrometry (FT-IR/FT-Raman). The present work describes testing the purity of materials by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). In ICP-MS testing, two important steps are defining the reliability and accuracy of the method: digestion of the samples and calibration. The digestion procedure and equipment calibration are described in detail. Experimental results are presented for the analysis of some ion excange resins (up to ppt).

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