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Title: Development and application of IBA methods for the analysis of samples

Abstract:

The PIXE technique is a multielement, non-destructive analytical method used for the analysis of a wide plethora of samples. The thesis presents the results of the calibration of PIXE equipment in the currently used geometry of the CENTA facility and the effect of the orientation of the targets on measured spectra. Samples of wooden tissue were processed using several approaches, the effects of which on the final spectra are discussed. The proposed method of sample preparation was used for processing cores obtained from trees in the control area and the vicinity of a glass plant and an aluminium smelter, in the vicinity of which an increased level of environmental pollution could be assumed. A direct dependence of the concentration in individual growth rings on the amount of emitted pollutants was not observed. A significant influence on the interface between heartwood and sapwood was visible. Low migration ability between tree rings was observed for Al, Cu, and Pb. Of the investigated trees (black poplar (*Populus nigra*), broad-leaved linden (*Tilia platyphyllos*) and European oak (*Quercus robur*)), the lowest absorption capacity for Al, Ca, K, Mg and P was observed for European oak.