

ION BEAM ANALYSES OF MEXICAN CULTURAL HERITAGE: RECENT RESEARCH AND COMPLEMENTARY TECHNIQUES

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Ion beam techniques have been developed for non destructive characterization of the Mexican cultural heritage since almost ten years ago in the Instituto de Física, UNAM [1]. Among the most powerful and useful techniques, Particle Induced X-ray Emission (PIXE) and Rutherford Backscattering (RBS) are the most versatile for such applications. Both are complementary, fast, multielemental, very sensible (up to $\mu\text{g/g}$) and non destructive methods.

In our Pelletron laboratory, PIXE and RBS have been used to analyze pottery, metallic artifacts, fragments of stucco and mural paintings, ancient documents, obsidians, bone remains, amber, etc., for studies of provenance, ancient technologies, relative chronology, use of materials and exchange of items [2]. Recently, luminescence induced by ions has been added to these techniques for the study of minerals and gems [3].

In the last years, the combined use of ion beam techniques and in situ analyses, such as portable X-ray fluorescence, gave rise to a powerful methodology for the non destructive characterization of the Mexican cultural heritage. Thus, the most representative objects and sampling, and the most suitable materials for the analysis in laboratory can be determined.

In this work, some outstanding applications of ion beam techniques and the used methodology to study various materials and topics are presented.

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