

[6]. C. Wang, **M. H. Eisa** et al, Experimental Consideration for Quantitative PIXE Measurements of Biological Samples, *18th International Conference on Ion Beam Analysis, 23<sup>rd</sup> to 28<sup>th</sup> September (2007), Hyderabad, India*

## Experimental Consideration for Quantitative PIXE Measurements of Biological Samples

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### Abstract

PIXE method has been widely used in investigating biological and medical samples for many years because of its non-destructive, sensitive and multi-element measurement nature. Nevertheless the variation in elemental results arose from sample preparation, geometrical conditions, radiation damage, overlapping peaks and other aspects should be carefully considered. The attempts to obtain accurate concentration of some heavy metal elements such as Cd and rare earth elements were failed because of strongly interfering element peaks. Besides, during our recent work on studying therapeutic effect of rhPTH (1-34) on Osteoporosis in rats, it was found that a large uncertainty of element concentration measurement could be occurred due to inhomogeneous and irregular surface of the bone samples. The sample damage resulting in mass loss was also severe. A new sample holder for external PIXE system at Fudan has been constructed in order to obtain a fixed measuring geometry for each run. Finally, absolute elemental concentrations could be obtained through normalization to reference standard at a standard error of mean of 5%.

*PACS:* 81.70.Jb;82. 80.Ej

*Keywords:* Biology; PIXE; target; matrix; accuracy; GUPIX