

Coupling X-ray spectroscopy and Scanning Probe Microscopy

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Abstract

Non-destructive tools providing elemental and chemical analysis at high resolution are necessary for life and material sciences. For example, electronics or glass industry needs in-lab tools for material processing and control (RRAM, FeRAM, smart materials, solar cells....). From the growth of interest for nanosciences, new tools have emerged to analyze matter at the nanoscale. That is the reason why focused incident beams were developed and are nowadays available on many set-ups. Combination of multiple characterization studies has become a necessity to be able to elaborate more complex materials and structures with a high quality control level. However, on most equipments, analysis is made at some area on the sample that is very difficult to refind using another characterization technique, especially when working at a nanometric scale.

To overcome this difficulty, the coupling and alignment of various analysis techniques and tools at the same point on a sample at this scale is now a reality even if it is still a sensitive issue. Among the recent progresses in this field, the coupling of near-field microscopy with other techniques has received great consideration. Because X-Ray spectroscopies are able to deliver very accurate chemical and structural information at the atomic scale, they were ideal candidates for this purpose. The idea of coupling both techniques emerged [1-4]. This lecture aims to give an overview of the most significant results that have been published since about ten years in this context.

References

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