SOME RECENT APPLICATIONS OF SYNCHROTRON NANOANALYTICAL METHODS

Gema Martínez Criado

Instituto de Ciencia de Materiales de Madrid (CSIC)

19 de ABRIL de 2018
Seminario de Física Teórica
Facultad de Ciencias
Universidad de Zaragoza
12:00 h

Owing to the spatial resolution and sensitivity (i.e., signal to background ratio), X-ray nanobeams are promising tools with a strong impact in nanoscience. Although the optical quality of the X-ray focusing optics has limited the progress of hard X-ray nanoprobes, recent progresses have pushed the spatial resolution towards the diffraction limit. Consequently, the exploitation of X-ray nanobeams has begun to extend towards the atomic domain, with concomitant and continuous developments of multiple analytical tools. Multiple interactions of X-rays with matter are behind manifold capabilities, such as ultra-sensitive elemental/chemical detection by X-ray fluorescence/X-ray absorption, or identification of minority polytypes and/or visualization of 3D morphologies with nanometer resolutions. In the present talk I describe how hard X-ray nanobeams are produced and exploited currently for space-resolved determination of structural and electronic properties, as well as for observation and chemical speciation of nanosized materials. Selected recent examples will range from single particle under realistic catalytic reactions, nanodevices during operation, to nanoheterogeneities captured in real time and real conditions, spatio-temporal interplay in nano-LED property-function relationships as well as hard X-ray nanolithographic effects.

icma
Instituto de Ciencia de Materiales de Aragón

CSIC
Consejo Superior de Investigaciones Científicas

Ciencias Zaragoza

Universidad Zaragoza
1542