UCL Faculté des sciences appliquées

FSA

MAPR2641 Compléments de cristallographie et applications des rayons X aux matériaux

[22.5h+15h exercises] 3 credits

This course is taught in the 2nd semester

Teacher(s): Jean-Paul Declercq, Pascal Jacques
Language: french
Level: 2nd cycle course

Content and teaching methods

X-ray detection, films, gas detectors, solid detectors, position sensitive detectors. X-ray diffraction by crystals, diffracted intensities: atomic formfactors, structure factors, Friedel's law, anomalous dispersion, temperature factor. Diffraction and symmetry, Laue groups. Relationship between electron density and structure factors. Diffraction by polycrystalline samples. Photographic and diffractometric methods. Calculation of the intensities of a powder sample. Qualitative chemical analysis, phases analysis. Indexation of powder diffractograms. Quantitative analysis. Other applications of the diffraction by polycrystalline samples. Width of the diffraction lines, dimensions of the particles. Phase diagrams. Surstructures. Texture, preferential orientations and pole figures. Measurement of residual stress. Diffraction by single crystals. Laue method. Photographic and diffractometric methods. Introduction to three-dimensional structure determination from diffraction data. X-ray scattering by non crystalline materials. Analysis of the radial distribution. Introduction to small angle X-ray scattering. Absorption of the x-rays and introduction to the EXAFS spectroscopy.

Other credits in programs

INCH22	Deuxième année du programme conduisant au grade d'ingénieur civil chimiste	(3 credits)
MATR22	Deuxième année du programme conduisant au grade d'ingénieur civil en science des matériaux	(3 credits)
MATR23	Troisième année du programme conduisant au grade d'ingénieur civil en science des matériaux	(3 credits)