

Characterizing nanomaterials through X-ray photoemission spectroscopy

Overview

Modern technology being advancing very rapidly demands new materials with improved properties in different field of our life from automotive or aerospace industries to electronics used in household and office appliances. The new materials have continued to be modified and improved at the expense of their composite construction and hence electronic structure. The best technique to know the inside of a material is the X-ray Spectroscopic tools.

High-energy (X-ray) spectroscopy methods play an outstanding role in research of the laws of atomic and electronic structure, and properties of various materials. The course provides complete information on the application of X-ray spectroscopy methods to study the composition, structure, nature of chemical bonds with an emphasis on carbon nanomaterials.

The course consists of an introduction and five sections, each of which is devoted to the fundamental principles, various aspects of the application and experimental implementation of various spectroscopic techniques for the diagnosis of carbon nanomaterials: X-ray photoelectron spectroscopy (XPS), photoelectron spectroscopy (PES), Auger electron spectroscopy (AES), X-ray absorption spectroscopy (XAS), X-ray emission spectroscopy (XES). Course participants will learn these topics through lectures and hands-on experiments.

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Modules	A: Theory and Applications of XPS (lectures and tutorials) : Dec 09 – Oct 13, 2022 Number of participants for the course will be limited to fifty (50).
You Should Attend if...	<ul style="list-style-type: none">▪ Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories.▪ Student at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.▪ You are a student or faculty from academic institution interested in learning about "X-ray Photoemission Spectroscopy analysis".
Fees	The participation fees for taking the course is as follows: Participants from abroad: US \$300 Industry/ Research Organizations: INR 10000 Academic Institutions: INR 5000 (faculty), INR 2500 (Ph.D. students) Discounted price will be offered to Bachelor and Master Degree students. The above fee includes all instructional materials, assignments, and 24 hr free internet facility. The participants will be provided with accommodation on payment basis.

The Faculty



Dr. Igor Asanov, Ph.D. in solid State Physics scientist at Laboratory of Physics and Chemistry of Nanomaterials, Institute of Inorganic Chemistry Siberian Branch of Russian Academy of Science, Novosibirsk, Russia. He is specialist in X-ray photoelectron spectroscopy and electronic structure of materials.



Dr. Sanjeev Gautam, Physics faculty in Dr. S.S. Bhatnagar University Institute of Chemical Engineering and Technology, Panjab University Chandigarh. He is a specialist for research in X-ray Absorption Spectroscopy (XAS), X-ray magnetic circular dichroism (XMCD) and High-resolution X-ray diffraction (HRXRD) using synchrotron radiation. His research interest in energy harvesting systems like perovskite photovoltaics, fuel cells, thermo-electrics and hydrogen catalysis and energy storage.

Course Co-ordinator

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