

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A&B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar

Org. by

Materials Science

Speaker: Prof. Michael Hirscher

Max Planck Institute for Intelligent Systems, Stuttgart

Date & time: Thursday, February 1, 2018; 3:00 pm

Venue: C V Raman Hall

Title: Interaction of hydrogen molecules with high-surface-area porous materials

Abstract: The field of porous materials has tremendously grown, when porous coordination polymers or frameworks could be prepared with a stable and robust structure after removal of solvent molecules, exhibiting ultra-high porosity and large specific surface areas. Immediately, these novel porous materials have been extensively studied for applications in gas storage and separation. For hydrogen storage, the maximum uptake at high pressure and 77 K shows an almost linear correlation with the specific surface area. In a storage system, two aspects have to be considered: i) the strength of different adsorption sites influences the operating temperature and ii) the density of the adsorbed layer together with the packing density dominates the maximum volumetric storage density. A new emerging application is hydrogen isotope separation, hereby two principle mechanisms can be utilized: i) confinement in small pores i.e. "Kinetic Quantum Sieving" ii) strong adsorption sites i.e. "Chemical Affinity Quantum Sieving". For different framework materials, experimental results indicate clearly a high selectivity for separating isotope mixtures of H₂ and D₂.

All are cordially invited to attend the Seminar