



School of Nano Science



IPM Condensed Matter &
Statistical Physics Group

Weekly Seminar

Photoelectrochemical Water Splitting by Hematite Photoanodes

Invited Speaker:

Dr. Ahmad Moshaii

Tarbiat Modares University & School of Physics, IPM

Abstract:

Hematite ($\alpha\text{-Fe}_2\text{O}_3$) is an attractive candidate for photoelectrochemical (PEC) hydrogen generation by water splitting. However, large-scale production of hematite thin films with efficient PEC performance is a challenging problem in the field. In this talk, we discuss about development of a scalable physical vapor deposition route for preparation of both Au and Co-Pi modified hematite thin film with efficient solar water oxidation properties. By optimization of the film thickness, the annealing temperature, and performing the deposition in an oxygen medium, an efficient PEC performance is achieved from the produced pristine hematite photoanode. Then by deposition of different thicknesses of Co-Pi electro-catalyst on the hematite layer, the optimum structure for fast water oxidation and fast charge transfer kinetics across the interface of photoanode and electrolyte is obtained. The most efficient photoanode delivers up to 1.5 (mA/cm^2) at the potential of 1.5 V, which is among the large photocurrents attained from a hematite-based photoanode, but with the advantage of large-scale production capability of this method.

Wednesday, 4 Mordad 1396 (July. 26, 2017), 14:00-15:00

Seminar Room (classroom A), Farmanieh Building, IPM

Organized by the School of Nano Science