

DEPOSITION AND CHARACTERIZATION OF NANOCRYSTALLINE HEMATITE CATALYTIC FILMS

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A new technique for deposition of nanocrystalline hematite film with photocatalytic applicability has been developed. Solid iron(III) chloride hexahydrate, used as a precursor, is thermally decomposed in dynamic air atmosphere, while iron(III) chloride oxide (FeOCl) film is formed on a substrate surface (FTO-coated glass). Afterwards, this FeOCl layer is converted to hematite utilizing a stream of hot air.

Phase compositions of the as-prepared samples were primarily characterized using ^{57}Fe Conversion Electron Mössbauer Spectroscopy and Grazing Angle X-Ray Diffractometry. Atomic Force Microscopy was used to evaluate the film thickness. The field emission Scanning Electron Microscopy was used to observe film morphology and Energy Dispersive X-ray analysis was carried out to evaluate element occurrence.

Main results of our measurements as well as early findings of photocatalytic activity evaluation will be presented. The photocatalytic activity is under influence of many factors, e.g. a chemical purity, a presence of doping atoms, film thickness and its morphology, what will be also discussed.

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