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The preparation of thin α-Fe2O3 films both by wet chemical sol-gel process and by plasma jet RF sputtering of hollow cathode

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Iron(III) oxide is an attractive material as a photoelectrode for photoelectrochemical and photovoltaic application due to the abundance of iron in the earth's crust, its low cost, chemical stability, and environmental harmlessness. Hematite (α-Fe_2O_3), the thermodynamically stable form of iron oxide, has a band gap of 2.0-2.2 eV which allows absorbing a substantial fraction of visible light [4-6]. Up to know the research has dealt with application of hematite for hydrogen production based on the photoelectrocemical splitting of water.
The presented work deals with the comparison of photoelectrochemical and photocatalytic properties of porous and non-porous Fe_2O_3 films prepared by the sol-gel method. The chemically prepared layer with the optimal properties was afterwards correlated with the properties of thin films prepared by sputtering of Fe_2O_3 hollow cathode by means of RF plasma jet. The photoelectrochemistry was measured in Pyrex three compartment cell with arc polychromatic high pressure mercury lamp (LOT LSH201 / 2 Hg, Xe) and monochromatic filters. The photocatalytic activity was determined by degradation of model ink DCIP.

Keywords
hematit
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