

Formation of Fe-containing functional materials and their activity in the process of photochemical hydrogen production

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Abstract

The possibility of hydrogen production simultaneously with the destruction of organic pollutants of water using natural sorbents: peat and zeolites modified with iron and synthesized silicon nitride, boron nitride with phase of iron was investigated. H₂-production rates (mL/h) and the performance of the investigated composites for hydrogen evolution (mkmol/h·g) were estimated under irradiation of aqueous solutions of carboxylic acids, hydrazine, phenolic compounds. It is shown that there is a principal possibility of using peat and zeolites modified with iron for the generation of hydrogen simultaneously with the destruction of organic toxicants in water, but the process efficiency is not high and requires further optimization. In the case of synthetic boron and silicon nitrides hydrogen evolution was more efficient. It has been found that production of hydrogen is the most effective in the aqueous solutions of formic acid and hydrazine with boron nitride.