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SRTIO3 BASED PHOTOCATALYSTS FOR HYDROGEN PRODUCTION

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Today, the global growth in energy demand has led to an active development of research in the areas of its production, storage, and use. The progress achieved in energy production technologies is not sufficient to fully meet the existing demand. The dwindling reserves of fossil fuels have prompted significant efforts to explore the use of hydrogen (H2) as a clean energy source. The use of H2 can solve the problems of depletion, pollution, and climate change. One of the technologies for the production of H2 is the photocatalytic splitting of water, the reserves of which are abundant on Earth.

The paper presents experimental data on the production of hydrogen by synthesized photocatalysts based on SrTiO3. Their physical and chemical properties have been investigated.

The objectives of the study are to obtain efficient photocatalytic cells with immobilized and suspended photocatalysts based on SrTiO3 with the addition of metal particles, followed by the study of the morphology of their surfaces and photocatalytic activity for hydrogen evolution. The main parameters for the preparation of photocatalytic cells with immobilized and suspended photocatalysts based on SrTiO3 with the addition of iron, copper and chromium particles have been investigated and determined. The thickness of the photocatalytic layer for fibers based on SrTiO3 with the addition of iron, chromium and copper particles for photocatalytic cells with an immobilized photocatalyst was studied, and the surface morphology of the formed photocatalyst layer was also studied. The rates of photocatalytic hydrogen evolution were investigated during the decomposition of water into hydrogen and oxygen under the action of ultraviolet (UV) radiation (40 W) for 24 hours using photocatalytic cells with immobilized and suspended photocatalysts.

The optimal parameters of the process of photocatalytic decomposition of water using photocatalysts based on SrTiO3 with the addition of metal particles using photocatalytic cells with immobilized and suspended catalysts have been determined.

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