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PHOTOCATALYTIC CONVERSION OF WATER/ METHANOL MIXTURE INTO HYDROGEN USING CERIUM/ IRON OXIDES BASED STRUCTURES

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This research work reports the photocatalytic production of hydrogen from water-methanol mixture using three different 15% ceria/ iron oxide catalysts. The catalysts were prepared by physical mixing, precipitation and ultra-sonication methods and labelled as catalysts A-C. The structural and texture properties of the obtained catalysts were confirmed by X-ray diffraction (XRD), Brunauer-Emmett-Teller (BET) surface area analysis and transmission electron microscopy (TEM). The photocatalytic activity of the three catalysts towards hydrogen generation was then tested. Promising hydrogen productivity was obtained by the three catalysts however different gases compositions were obtained by each type of catalyst. Specifically, catalyst A had produced hydrogen mixed with CO2 while the composite structure (catalyst B) had generated only pure H2. In the case of catalyst C, syngas made of H2 and CO was revealed, as a novel product, for the first time, in such process.

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