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PHOTOCATALYTIC H₂ AND ADDED BYPRODUCTS: THE ROLE OF METAL OXIDE SYSTEMS IN THEIR SYNTHESIS FROM LIQUID OXYGENATES

Paolo FORNASIERO

Dept. of Chemical Sciences, University of Trieste, Italy

Abstract:

The growing demand for hydrogen for industrial use and as a fuel pushes for innovative and sustainable production strategies, which can be applied both in centralized, large-scale plants and in delocalized small units. An attractive option is the photocatalytic reforming of oxygenate / biomass-derived compounds. [1,2] In fact, upon photoactivation in the presence of an appropriate semiconductor, such feedstocks can undergo oxidation to CO₂ with simultaneous H₂ production. However, when the oxidation is selective rather than complete, the process might be of further interest due to the added value of the obtained carbon-containing by-products. In this respect, there is a growing interest in the exploitation of representative biomass-derived oxygenated compounds, such as methanol, ethanol, glycerol, and sugars.

1. M. Cargnello, A. Gasparotto, V. Gombac, T. Montini, D. Barreca and P. Fornasiero, *European Journal of Inorganic Chemistry* 2011 (2011), 4309-4323.

2. D. Barreca, G. Carraro, V. Gombac, A. Gasparotto, C. Maccato, P. Fornasiero and E. Tondello, *Advanced Functional Materials* 21 (2011), 2611-2623.