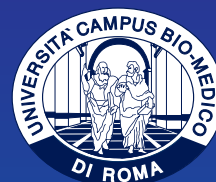




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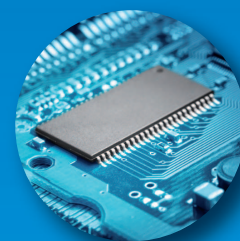
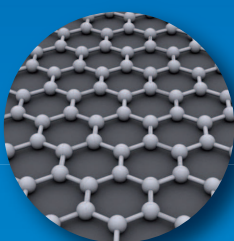


VI WORKSHOP NAZIONALE AICIng

Molecules and materials: Chemistry for Engineering

Roma, 22 e 23 giugno 2015

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ATTI DEL CONVEGNO

H₂ and value added chemicals from photocatalytic conversion of glucose

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Glucose, as biomass model, is an attractive renewable source for H₂ and valuable chemicals production. Conventional technologies used for this purpose as steam reforming, biochemical processes, thermal catalysis, pyrolysis, require severe reaction conditions and/or the use of expensive and toxic oxidants. In this context, heterogeneous photocatalysis can be also considered as an effective alternative because it can be carried out under mild experimental conditions and by using green solvents.

Commercial (P25), home prepared (HPR) TiO₂ and Pt-TiO₂ samples have been used for aerobic (in the presence of air) and anaerobic (bubbling N₂) aqueous glucose conversion. The runs were carried out at room temperature and ambient pressure in a 800 mL Pyrex reactor irradiated in the UV region with an immersed 125 W medium pressure Hg lamp. The initial aqueous glucose concentration was 1 mM and the runs were carried out at natural pH.

The distribution of the products strictly depended on the type of photocatalyst both in the presence and absence of air but Pt resulted essential for the production of H₂ as hydrogen was not detected by using naked TiO₂ photocatalysts. The main products were arabinose and formic acid. Erythrose was also found in the presence of HPR and HPR-Pt0.5.

References

[1] R.Chong, J. Li, Y. Ma, B. Zhang, H. Han, C. Li, *J. Catal.*, **2014**, *314*, 101-108.