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Carbon Dots from Cork Industry Wastewater as Reusable Catalysts for Alcohols Oxidation

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Abstract

Selective oxidation of alcohols plays a central role in many important and relevant industrial processes, from commodities to pharmaceuticals [1]. In recent years, metal-based catalytic processes, either homogeneous or heterogeneous, have superseded the classical oxidation methodologies based on stoichiometric amounts of hazardous oxidants [1,2]. Particularly, the last 15 years witnessed an astonishing development of catalytic systems that rely on metal or organocatalysts in conjunction with environmentally acceptable oxidants such as hydrogen peroxide and dioxygen [1,3]. Carbon-based nanomaterials have more recently entered the field of catalytic oxidations.

Herein, carbon dots produced from cork industry wastewater (Figure 1) are provided to design improved catalytic processes for selective oxidation reactions of industrial interest such as the oxidation of primary and secondary alcohols to, respectively, aldehydes and ketones (Scheme 1).

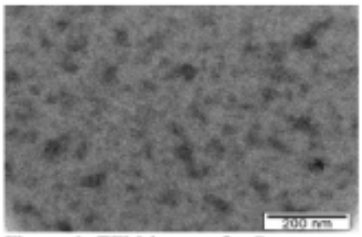

Figure 1: TEM image of a C-nanomaterial prepared from cork industry wastewater.

Scheme 1: Oxidation of alcohols to aldehydes or ketones catalysed by C-dots prepared from cork industry wastewater.

The activity of the prepared materials was tested in batch and the effects of reaction parameters, such as reaction time, temperature, type and amount of oxidant are reported and discussed.

References

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