Design of nanostructured materials for photocatalytic application: from nanoparticles to aerogels

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Resumen

Photocatalytic processes promoted by semiconductor nanomaterials offer a sustainable and promising approach for applications in environmental remediation, energy conversion, and the development of self-cleaning surfaces. However, practical technological applications of heterogeneous photocatalysis are still limited due to the low performance of photocatalysts developed so far. Research at the Chemistry/Materials Science interface is essential for the development of synthetic routes to obtain and control the properties of new nanostructured photocatalysts that enable practical applications of heterogeneous photocatalysis. In this presentation, recent work from our research group related to the controlled synthesis of nanostructured materials with high photocatalytic activity for environmental applications will be discussed. Special emphasis will be placed on studies concerning the preparation of photoactive nanoparticles and hybrid aerogels, and the impact of their physicochemical and electronic properties on the observed photocatalytic activity.