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6th EuCheMS Chemistry Congress

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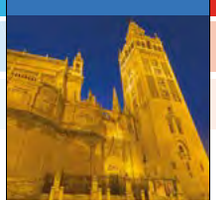


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11th–15th September 2016

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POSTER DISCUSSIONS

Topic E2- Nanomaterials, Devices, Technology and applications . *Poster Area - Module A*

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Martín Testa Anta ***(ES).***

Poster **Abstract 970**
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Sandra Sanchez-Gonzalez ***(ES),*** Nazely Diban, Inmaculada Ortiz, Ane Urtiaga.

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Juan Emilio González González ***(ES),*** Jenifer Vaswani Reboso, Baltasar Peñate Suárez, Jesica Castellano Vera.

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Self-cleaning materials active in the visible range based on porphyrin-sensitised titanium dioxide
Sebastiano Cataldo ***(IT),*** Carolina Giunta, Michelangelo Scopelliti, Tiziana Fiore, Felicia Cavaleri, Lavinia Vaccaro, Simone Agnello, et al.

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Elena Romero Ben ***(ES),*** Juan José Cid Martín, Mohyeddin Assali, Noureddine Khiar.

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Christian Rosales Barrios ***(ES),*** Emilio Guillén Mancina, Elena García de Dionisio, Miguel López Lázaro, Noureddine Khiar.

Poster **Abstract 1232**
An original nanostructuration of a gold substrate for electrochemical sensors of nitrates
Fajerwerg Katia ***(FR).***

Self-cleaning materials active in the visible range based on porphyrin-sensitised titanium dioxide

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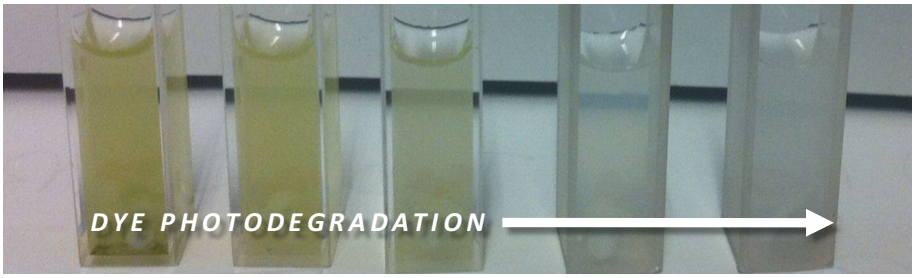
In the last decades, nanostructured semiconductors played a central role in the material science scene because of their numerous applications spanning from renewable energy to organic/hybrid electronics up to photocatalysis.

Titanium dioxide is one of the most used semiconductors because of its low cost, chemical stability, sustainability and versatility. Indeed, it is widely employed as photo-active or charge-transporting material in electronic devices, as photocatalyst in water de-pollution treatments etc.. Remarkably, one of the most interesting application of titanium dioxide consists of the protection and conservation of cultural heritages. Actually, TiO_2 photocatalytic properties are exploited for self-cleaning materials able to passivate artifact surfaces and degrade organic pollution, thus preventing blackening while reducing maintenance costs.

Unluckily, the photoactivity of TiO_2 is limited to the UV range limiting its performance under the natural sunlight exposition or artificial illumination. In order to enhance the performance in both outdoor and indoor conditions, it is crucial to extend its light absorption range up to the visible region.

To this goal, in this work we prepared novel TiO_2-based materials functionalized *in-bulk* with *meso*-tetra(carboxyphenyl)-porphyrin (TCPP) and its metal derivatives (Me-TCPP), which served as visible-light sensitizers. The particular wet sol-gel route employed for the synthesis makes the porphyrin dye bonded inside the TiO_2 structure and not easily adsorbed to the surface. The material structure, composition and electronic properties were investigated by XRD, Raman and photoelectron spectroscopies (XPS and UPS) while photocatalytic properties under both UV and visible light were studied by following the degradation kinetic of carminic acid by UV-Vis spectrophotometry.



The visible-light sensitised materials showed an enhanced photocatalytic activity with respect to commercial titanium dioxide in different illumination conditions, indicating that the inclusion of dyes *in-bulk* is a valuable strategy to obtain efficient visible-light active TiO_2 photocatalysts.