

9<sup>th</sup> World Congress on

# Green Chemistry and Technology

September 17-19, 2018 | Amsterdam, Netherlands

## Chemometric assessment and investigation of mechanism involved of TiO<sub>2</sub> photocatalytic processes of artificial sweetener sucralose in aqueous media

Vasilios Sakkas<sup>1</sup>, M Sarr<sup>2</sup>, M Kalaboka<sup>1</sup>, V Santoro<sup>2</sup>, T Albanisa<sup>1</sup>, P Calza<sup>2</sup> and C Medana<sup>2</sup>

<sup>1</sup>University of Ioannina, Greece

<sup>2</sup>University of Turin, Italy

Photocatalysis has great potential to be a cost-effective water purification technology for the removal of low concentration recalcitrant organic pollutants, including emerging contaminants such as pharmaceuticals, personal care products, sweeteners etc. TiO<sub>2</sub> photocatalytic oxidation of stevioside (STE) was investigated with the scope of determining the degree of variation of the oxidation process under a variety of conditions such as initial stevioside concentration, and water matrix. As a tool of investigating the effect of the above factors on the variation of the photocatalytic efficiency, a fully nested experimental design was employed. A significant impact on the degradation rate of the sweetener was observed: degradation rate decreases in the order distilled water > river water > lake water, attributed to the increased natural organic matter content of the respective natural water samples. Moreover, the investigation has involved the identification of intermediate compounds, as well as the assessment of mineralization and toxicity evaluation. More than one hundred unknown transformation products, most of them in the form of several isobaric species, were identified. By employing accurate mass determination, we were able to attribute an empirical formula to each species and through MSn analysis we were capable to distinguish several isobaric species. The overall transformation mechanism was assessed and involved the hydroxylation/oxidation of the molecule and the subsequent loss of the glucose units bound to the parent compound.

### Biography

Vasilios Sakkas is an Associate Professor of Analytical Chemistry in the Department of Chemistry of University of Ioannina. He has received his PhD in Chemistry from the same University in 2002 and started his academic career as Adjunct Professor in the Department of Materials Science and Engineering 2003-2007. His research interests are devoted to the topics of Analytical Chemistry, Chemometrics, Environmental Chemistry and Environmental Technology.

vassakkas.cc.uoi.gr@gmail.com

### Notes: