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Juliette Karpiel[1], Pierre Lonchambon[1], Frédéric Dappozze[2], Nathalie Herlin[1], Chantal Guillard[2]

[1]*University of Paris-Saclay, CEA, CNRS, NIMBE, 91191 Gif-sur-Yvette Cedex, France*

[2]*University of Lyon 1, IRCELYON, CNRS, Université Claude Bernard Lyon 1, 2 avenue Albert Einstein F-69626, Villeurbanne, France*

Email: juliette.karpiel@cea.fr, +33-7 86 84 90 05

Abstract {Max words limit 250}

Alkenes, and more particularly ethylene, are essential organic molecules for chemical and petrochemical industries and are needed in ton quantities. New ways are developed to produce ethylene without hydrocarbons. They mainly focus on dehydrogenation reactions from ethanol. However, these processes often require a significant energy consumption despite the use of heterogeneous acid catalysts, with high temperature and/or pressure. In this context, we aim to synthesize environmental-friendly and low-cost photocatalysts, which could degrade organic compounds such as alcohols and acids into alkanes and alkenes. In order to achieve this aim, TiO_2-based photocatalysts were synthesized from TTIP (Titanium Tetra Isopropoxide) precursor by an original gas-phase method, the CO_2 laser pyrolysis technique. It offers a great flexibility in obtaining small and homogeneous nanoparticles (5-60 nm size ranging), with controlled crystallinity and carbon contain. Addition of graphene in TTIP allowed to obtain graphene-modified TiO_2 composites (from 0.04 to 2.00 wt% regarding TTIP). First results show an evolution of the specific surface related to the graphene content. These photocatalysts were first used for photo-oxidation of formic acid and shew an improvement for formic acid degradation at low graphene content by comparison to pure TiO_2. Theses composites were also tested for alkene production from propionic acid photo-reduction.

Biography {Max words limit 100}

Juliette Karpiel received her engineering master degree in materials sciences in 2019. She now is a PhD student affiliated to the French Alternative Energies and Atomic Energy Commission (CEA) in the fundamental research department based in Paris-Saclay. She also works with the Research Institute on Catalysis of Lyon (IRCELYON), a world-class research center dedicated to the overall understanding of catalyzed reactions applied to industrial and societal issues in the fields of Energy, Chemistry and Environment.