

MS16-P11 | MORINGA OLEIFERA WASTE AS DOPANTS FOR S, N, C-TiO₂ PHOTOCATALYSTS DEVELOPMENT

AGBAHOUNGBATA, Marielle Yasmine (University of Zurich, Zürich, CH); LINDEN, Anthony (University of Zurich, Zürich, CH)

Titanium dioxide (TiO₂), finds a wide range of applications in environmental remediation such as air/surfaces sanitization, wastewater treatment, due to its photocatalytic properties. However, one of the main shortcomings of TiO₂ is its wide band gap which restrains its use to UV light. Therefore, the development of TiO₂ materials with enhanced visible light activity is important for using solar energy as the light source during the photocatalytic process. This is often the result of electronic structure engineering of materials through doping. An effective way is to dope TiO₂ with non-metal elements such as carbon (C), sulphur (S), nitrogen (N), fluorine (F), etc., especially the incorporation of multiple dopants (codoping) which was found to be an efficient strategy for improving TiO₂ visible light activity [1].

On the other hand, it is known that Moringa oleifera seeds contain some chemical compounds rich in carbon, nitrogen and sulphur [2]. Usually, after oil extraction, the seed residues become a waste. In this study, several compounds have been isolated from Moringa oleifera residues. Those, which contain carbon, nitrogen and sulphur have been used for TiO₂ codoping. Several techniques, especially X-ray diffraction, were used to characterise the obtained S, N, C-TiO₂ photocatalysts. The results showed that Moringa oleifera waste could be valorised as dopant to develop a simple and efficient method for the preparation of novel TiO₂ based photocatalysts.

[1] J.A. Rengifo-Herrera, Sol. Energy 84 (2010) 37

[2] Amelia P. Guevara, Mutation Research 440 (1999) 181–188