

10th World Congress on Green Chemistry and Technology

July 10-11, 2019 | Paris, France

Current state of the art on green synthesis of iron-based nanoparticles: a case study of iron nanoparticles from Argentine *Yerba mate* and green tea extracts useful for removal of pollutants in soil and water

A revision on the literature on green synthesis of iron-based nanoparticles and their application as nanotechnology for removal of pollutants from soil and water will be presented, highlighting the uncertainties about their chemical identity and efficiency for removal of pollutants. In addition, the need of further improvement in order to obtain stable nanoparticles of controlled size and morphology, conducive to large-scale synthesis of iron nanoparticles for environmental remediation and hazardous waste treatment applications will be stressed. As a study case, the preparation of iron-based nanoparticles synthesized from iron salts and water extracts (polyphenols) of powdered *Yerba mate* (*Ilex paraguariensis* Saint Hilaire) will be described. *Yerba mate* is highly consumed as an autochthonous tea in Paraguay, Uruguay, Brazil and Argentina. The nanomaterials have been completely characterized by XRD, Raman and Mössbauer spectroscopies and their applicability for Cr(VI) and As(III)/As(V) removal from polluted waters have been tested in laboratory tests with synthetic and real waters from Argentina and compared with other tea extracts such as green tea and commercial zero valent iron nanoparticles. The nanomaterials are low-cost, nontoxic and can be easily produced at large scale. They can be used for removal of other pollutants (e.g. mercury, uranium, lead, nitrate, halogenated hydrocarbons, pesticides such as 2,4-D, etc.).

Biography

Marta I Litter has completed her PhD in Chemistry from Buenos Aires University, Argentina, with Post-doctoral studies at the University of Arizona, USA. She is a Superior Researcher of the National Research Council and Full Professor at the National University of General San Martín. She has been the Head of the Division of Environmental Chemistry Remediation (National Atomic Commission) all in Argentina. She has more than 200 scientific publications in international journals, books and book chapters. She has received the Mercosur Prize in Science and Technology (2006 and 2011) and was President of the International Congress on Arsenic in the Environment (2014). She was designated pioneer on photocatalysis in Argentina (2016) and accepted as a Member of TWAS (2018).

marta.litter@gmail.com



Marta Irene Litter

National Atomic Energy Commission,
Argentina

Co-Authors

Martin Meichtry and Fabiana Garcia

National Atomic Energy Commission,
Argentina