Fabre E et al., J Ind Environ Chem 2019, Volume 3 | DOI: 10.4066/2591-7331-C2-011

WATER REMEDIATION TREATMENTS: THE APPLICATION OF DIFFERENT SORBENTS FOR MERCURY REMOVAL

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Water contamination by the disposal of toxic metals is recognized as a worldwide concern. Mercury is known as relevant hazardous pollutant due to its toxicity and biomagnifications along the food chain, causing serious impacts on environment and human health. A variety of processes are available for the treatment of contaminated aqueous waste streams. Sorption processes are considered better alternatives because they are easy to operate, economic and allow treating solutions with realistic concentrations. Among the different solids for sorption processes, the synthetic sorbents such as the zeolite-type materials are very selective and present high surface areas and great removal capacities. Niobium silicates, like AM-11 and NS91 and vanadium silicates like AM-14, have showed excellent performances for Hg (II) removal. On the other hand, biological wastes from agriculture and industry represent lower cost options for sorption operations. The biosorbents are largely available in nature and contain functional groups capable to bind the target metal in solution. They require few or any chemical and thermal pre-treatments and may provide alternative options for water treatment and waste management. Banana, potato peels, egg shells, Eucalyptus globulus bark and leaves, mushrooms and water hyacinth etc., are examples of efficient biosorbents applicable in this work. The right choice for each process is not a trivial task. In line with one of the goals of 2030, Agenda for Sustainable Development of United Nations, which promotes the improving of water quality by reducing water contamination and foments an enhance in wastewater treatment, this work encourages the safe water reuse by investigating and evaluating new efficient and viable sorbents for the application in remediation processes for mercury removal.

BIOGRAPHY

Fabre E has completed her Degree in Chemical Engineering at Federal University of Santa Catarina, Brazil. She is a PhD student in Chemical Engineering at University of Aveiro, Portugal and engaged in research and publications about sorption processes for water treatment. She has worked with the search of innovative materials for the purpose of metals removal under environmental realist conditions for real applications in line with the concept of circular economy. She is member of the associated laboratory CICECO–Aveiro Institute of Materials which is the largest Portuguese Institute in the field of Materials Science and Engineering and she is also member of the associated laboratory CESAM–Centre of Environmental and Marine Studies.

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