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Biocomposite based on tara gum for arsenic remotion in water from mining industry

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One of the most dangerous pollutants that could be present in water is arsenic, which accumulates in all living beings, producing arsenisism in humans. Mining is a strong industry in Peru. Extraction process produces high quantity of polluted sludge than is difficult to manage. The methods commonly used for removal of arsenic contain iron, which is capable of binding to remove arsenic from the contaminated source, produce a large quantity of sludge, that it´s difficult to manage. Tara gum is a natural product obtained of Tara tree. Its product is useful as an additive for the food industry and its biodegradability. Sludge obtained from remotion of arsenic in water product of mining, could be removed using the magnetite nanoparticles. Tara gum that provide surface area will be degraded naturally and arsenic from magnetite nanoparticles are removed using a magnet, removing the sludge management. A biocomposite based on magnetite nanoparticles supported on Tara gum was prepared using coprecipitation method in controlled atmosphere. Remotion of arsenic studies shows that the new material can removed 40% using a solution with 2 ppm of arsenic. Magnetite nanoparticles are responsible of arsenic removal, which are more efficiency because of its small size. The new material is eco-friendly because it can be biodegradaded by exposed to the environment. Water obtained after treatment can be incorporated to water bodies or used for agricultural purposes without negative effects.

Biography

Silvia Ponce , researcher at the Institute of Scientific Research (IDIC) of the University of Lima and PhD in Chemical Sciences from the Autonomous University of Madrid , has been awarded the first place in the L'Oréal-UNESCO-Concytec National Award for Women in The science. She was presented with the project "Processing of agricultural waste to obtain fuels that can be used in kitchens in rural Andean areas with less domestic environmental impact", that to rise as the winner of this contest will receive a grant of 30,000 nuevos soles . Currently, Dr. Ponce leads a team involved in an initiative contemplated by the National Council of Science and Technology (Concytec) that is being developed at the University of Lima. Using specially developed materials, this project proposes the degradation of volatile organic compounds in water, such as pesticides in Apurímac farms. Throughout her career, the doctor has participated in various projects related to the environment. Among them, there is a practical bag that, with the help of solar radiation, decontaminates water, whose research and development were encouraged by the National University of Engineering and the University of Buenos Aires.

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