عنوان مقاله:

An Evaluation of the Activity of Prepared Zinc Nano-Particles with Extract Alfalfa Plant in the Treatments of Peptidase and Ions in Water

محل انتشار:

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خلاصه مقاله:

After harvesting, Alfalfa plant was washed, dried and ground to get fine powder used in treatment water. We used alfalfa plant with ethanol to made alcoholic extract and characterized it applying (GC-Mass, FTIR, UV) spectroscopy to determine active compounds. Alcoholic extract was used to prepare zinc nanoparticle. We characterized Zinc nanoparticles by using FTIR, UV, SEM, EDX Zeta potential and AFM. Zinc nanoparticle with Alfalfa extract and alfalfa powder was used to treat pollutant water with pesticides and negative ions by two methods, namely Batch and continuous processing. Batch process was used two times firstly, with Alfalfa plant to treat water affected by pesticides and negative ions, after ۱h pesticides (glyphosate ۴۴.۷۶%, sulfon ۴۹.۲۱%) Negative ions (NO۳ ۳۳.۸%, NO۲ ۴۶.۸%, ۱۷.۲%) and when left it ۵h to get treated off pesticides (glyphosate ۶۴.۵۲%, sulfon ۶۹.۳۸%), Negative ions (NO۳ ۷۱%, NO۲ ۸۰%, SO۴ ۷۰%). Secondly, we used with Zinc nanoparticles to treat water after ۱h pesticides (glyphosate ۷۱.۴۵%, sulfon ۵۲.۶%) Negative ions (NO۳ ۷۲.۱۳%, NO۲ ۱۴.۵۰% SO۴ ۷۸.۳۰%) and when left ۵h (glyphosate ۸۱.۲۶% sulfon ۶۰.۱۱%) Negative ions (NO۳ ۷۹.۵۵%, NO۲ ۳۲.۴۵%, SO۴ ۸۶.۸۰%), followed by continuous processing flowrate pertaining to pesticides (glyphosate ۵۷.۴۴%, sulfon ۵۹.۵۰%), Negative ions (NO۳ ۳۲.۲۴%, NO۲ ۶.۲۸%, SO۴ ۶۵.۵۷%). Zinc nanoparticles were treated in continuous process at concentration ۱۰ ppm only for pesticides for ۱h to get treated (glyphosate ۷۷.۲۲%, sulfon ۱۰۰%) and concentration ۵۰ ppm for treating pesticides (glyphosate ۶۴.۵۲%, sulfon ۶۹.۳۸%), Negative ions (۷۵.۴۱%, ۱۸.۶۹%, ۹۰.۷۰%). Comparing the two process, we found the continuous one more efficient than batch process. Further, comparing alfalfa powder and zinc nanoparticle, we found treatment with zinc nanoparticle more efficient and most removal for organic and inorganic pollutant.

کلمات کلیدی:
Nanoparticles, Alfalfa plant, ions, Pesticides, Wastewater treatments