

HEAVY METALS REMOSION IN POLLUTED WATER USING INNOVATIVE FILTERS JAM-PACKED WITH NATURAL ZEOLITES AND FERRIC NANOPARTICLES

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Abstract: Any filter is a technology that assists to remove suspended materials in any solution, such as water. The objective of this research was to evaluate the water decontamination capacity of new filters packed with ferric nanoparticles and natural zeolites. Eight treatments upcoming from a factorial arrangement 2x2x2 were evaluated. Factor A was the ferric nanoparticle with dos levels; 10 g and 20 g. Factor B was the natural zeolite with dos levels; 40 g and 60 g. Factor C was the utilization of magnet in the filter with two levels; with and without magnet. Two repetitions were used; therefore, a total of 16 experimental units were evaluated. In addition, two commercial filters were used to compare results with experimental filters. The zeolite was appropriately characterized by the Mexican Geology Service's Laboratory. The levels of the following elements were measured in water; As, Ba, Ca, K, Mg, Mn, Na, Pb, Se, Sr, Ti, Al, Cd, Co, Cr, Cu, Fe, Hg, Ni, Sb and Zn before going throughout the filter. The ferric nanoparticle was generated in the laboratory of La Campana site experimental station (INIFAP) located in Aldama city and categorized in the Center of Research for Advanced Materials in the city of Chihuahua, Mexico. The statistical analysis was using a paired difference (means of the differences). The results of the zeolite showed a calcic heulandite which minerals were 61.43% of $\text{CaAl}_2\text{Si}_7\text{O}_{18} \cdot 6\text{H}_2\text{O}$, 10.16% of $\text{NaAlSi}_3\text{O}_8$, 9.78% of KAlSi_3O_8 , 6.77% of A-SiO_2 and 6.55% of SiO_2 . The data concerning nanoparticles, influent water and effluent water is being obtained and will be presented complete in the symposium.

Keywords: Heulandite, ferric nanoparticles, water filter, metal decontamination

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