"EFFECT OF IONIC FORCE AND ION COMMON WASHING PROCESSES AND THE BIOLOGICAL REMOVAL OF PETROLEUM HYDROCARBONS IN CONTAMINATED SOIL"

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Introduction. The contamination by total petroleum hydrocarbons presents a global problem (1), so he makes use of biotechnology, which aims to be responsible and environmentally friendly (2). Therefore, carried out as methods of decontamination washing and bioremediation of soils that are improved with the use of surfactants (3) and salts, when SDS is used, there occurs a problem of precipitation due to high content of Ca, Mg and Mn in the soil (4), so that the removal percentage values decrease (1), that is because the ions of Ca, Mg and Mg, interact forming SD-Mg, SD-Ca or SD-Mn. To counteract this, several authors propose the following: a) Use of surfactant mixtures, b) Adding the sodium salts of SDS solution and c) Add to capture sequestering Ca ions, Mg and Mn (1, 3 and 4).
The objective of this project is to determine the effect of ionic strength and common ion washing processes and the biological removal of petroleum hydrocarbons in contaminated soil.

Methods. Soil washes were performed in a ratio of 1:3 (w / v) (Ω = 180 rpm, t = 24 h t = 38 ° C) with a solution of 0.5% SDS, added with Na_2SO_3, Na_2CO_3, Na_2SiO_3, NaCl and $NaNO_3$ with six different ionic strengths (0.1, 0.3, 0.5, 0.7, 1.0 or 2.0 M). HTP's were analyzed for the soxhlet extraction system and after gravimetric method was used. In the bioremediation process solution was used at the same concentration, together with salts thereof and the ionic strengths, these remained for 45 days incubation at room temperature; finally also residual hydrocarbons were determined (5).

Results. As for the washing of the soil removal percentage of hydrocarbons with the SDS solution (7.2%) was almost twice that obtained when the soil washed only with water (3.8%). The results obtained are shown in Figure 1. It can be seen that the removal of hydrocarbons is strongly influenced by the ionic strength and the type of salt, showing results ranging from 3.96% to 80.73% removal. Moreover it is working on the bioremediation determining the percentage of hydrocarbon removal in soil.

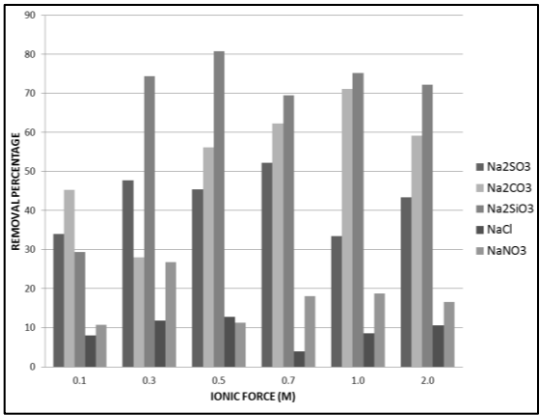

Fig. 1 Porcentaje de remoción de HTP´s en el proceso de lavado de suelos.

Conclusions. SDS efficiency in soil washing, improved significantly with the addition of sodium salts unlike when interacted only. The higher removal percentages were obtained with divalent salts aside to monovalent. This is attributed to the common ion effect and ionic strength applied.

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