

VACUUM CLAY NANOTECHNOLOGY TO REDUCE, REUSE AND RECOVER OF WASTE AND RAW MATERIALS IN DIFFERENT INDUSTRIES

Carla Palencia Aguilar

Lund University, Sweden

Clays with molecular size of 3Å were used to filtrate petroleum based hydrocarbons and sea water. Three components with different viscosities were tested with sea water mixes of 50%-50% and 25% of oil and 75% of water at changes in pressure in a 12-hour cycle. The results showed water removal of 65% to 80%. The clay-nanofilters allowed the separation oil-sea water without adding more substances facilitating the possibility to oil reuse in a lower grade mineral products. One of the major advantages of the system is the recovery of substances (in gas or solid state) for the development of other products by combination, stabilization and consequently pollution reduction. Treated engine oil contained higher values (in ppm) in elements such as Mo, B, Mg, P and Zn than not treated engine oil under the Vacuum Clay-Nanofilters technology, but they were within the acceptable ranges for reusable oils. Other results reinforce the fact that Vacuum Clay-Nanofilters technology reduces elements' content of Al, Cu, Fe, Na, Si and Ca and destroys Cr, Pb, Sn and K within the reusable product. Different from other available technologies, the clay-nanofilter is two folded: on one hand it can destroy cells (separate or force them to leave the system), on the otherhand, it can concentrate characteristics such as vitamins, nutrients, inulin and probiotics in agribusiness applications. Experimental results for destruction showed that from seawater with 8 cells/g at 1:1 dilution, after the vacuum clay process, at 1:100 dilutions, less than 100 cells/g were found, and seawater with sediments at 1:100 dilutions with 12000 cells/g, at the same dilution, after the process, there were < 100 cells/g. Experimental results for concentration showed that: *vitamin content* could increase at least 5 times more than the natural product for the same analysed quantity, for *inulin content*: 3.5 times more.

carlapalencia@hotmail.com