



W12.01-P-27

SOLUBILIZATION OF HERBICIDES BY SINGLE AND MIXED COMMERCIAL SURFACTANTS

Undabeytia Tomas*^[1], Galan-Jimenez Carmen^[1], Gomez-Pantoja Eulalia^[1], Morillo Esmeralda^[1]

^[1]Institute of Natural Resources and Agrobiology (IRNAS-CSIC) ~ Agrochemistry and Soil Conservation ~ Seville ~ Spain

Environmental applications of surfactants have been increasing during the late decades due to their unique properties as solubilizing agents. Surfactants are amphiphile molecules which aggregate in solution beyond certain concentration called the critical micellar concentration (cmc), forming usually spherical structures of several nm with large hydrophobic domains in their core whereas hydrophilic surface groups are located in the outer surface. Non-aqueous phase liquids (NAPLs) such as polycyclic aromatic hydrocarbons (PAHs) and in general, hydrophobic organic chemicals (HOCs) tend to be strongly incorporated within the micellar core because the hydrocarbon region forms a liquid-like region having a viscosity approximately an order of magnitude greater than that of liquid hydrocarbons of similar chain length. Surfactant-enhanced remediation (SER) technologies take the benefit of this property. Most of the studies on solubilization by surfactants have focused on non-polar solutes such as PAHs, NAPLs. In the current work, the solubilization of three herbicides (two nonionic, flurtamone and metribuzin, and one acidic, mesotrione) by single and binary combinations of several commercial surfactants was examined. The surfactants used were two alcohol alkoxylates, a polyalkylglucoside and a tallow alkyl ethoxylated amine. The results will help to understand the processes involved in the solubilization of molecules with different functional moieties in their structure, and to predict the solubilization properties of mixed surfactant solutions based on that of single surfactant. This will provide valuable information for the selection of different surfactant systems on their employment in environmental technologies.