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PHOTODEGRADATION OF DDTs IN MICELLAR SOLUTIONS

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Organochlorine pesticides are toxic compounds which can affect to human health¹. Their lipophilic nature, hydrophobicity and low chemical and biological degradation rates have led their accumulation in biological tissues and subsequent magnification of concentrations in organisms progressing up the food chain²; for these reasons are listed as US Environmental Protection Agency (EPA) priority pollutants³.

The degradation pathway of DDT in water is: 4,4'-DDT → 4,4'-DDD and 4,4'-DDE; and at the same time 4,4'-DDE → 4,4'-DDD. A rough estimation of half life is about 20 years for 4,4'-DDT and about 15-20 years for 2,4'-DDT⁴.

Several studies on the photochemical transformation of DDT in water have been reported^{5,6}, but these compounds are practically insoluble in water and for doing their degradation and their quantification can be necessary add organic solvent⁵.

As alternative, the solubilization and photochemical degradation of these compounds can be done in micellar solutions.

In this work we study the degradation under UV-light at 254nm of a family of organochlorine pesticides (4,4'-DDD, 4,4'-DDT, 2,4'-DDT and 4,4'-DDE) in the presence of several surfactants of different chemical properties: an anionic surfactant, Sodium Lauryl Sulfate (NaLS), a cationic one, Hexadecyl-trimethylammoniumbromide (HTAB) and a non-ionic surfactant, Polyoxyethylene 10 Lauryl ether (POLE), with the purpose of study their influence in the solubilization of these organochlorine pesticides at different concentrations and in the degradation of the mentioned pesticides.

References

1. M. Maroni, C. Colosio, A. Ferioli and A. Fait, *Toxicology*, 143 (2000) 61.
2. H. Mwevura, O. Othman and G.L. Mhehe, *Mar. Pollut. Bull.*, 45 (2002) 262.
3. U.S. Environmental Protection Agency. Toxic Substance Control Act, US EPA, Washington DC, (1979).
4. A. Nawab, A. Aleem and A. Malik, *Biosesource Technol.*, 88 (2003) 41.
5. F.L. Lépine, F. Brochu, S. Milot, O.A. Mamer and Y. Pépin, *J. Agric. Food Chem.*, 42 (1994) 2012.
6. J. Hong, J.S. Yoo, S.Y. Jung and K.J. Kim, *Anal. Sciences*, 13 (1997) 75.