

# Official external seminar

AARHUS UNIVERSITY DEPARTMENT OF ENVIRONMENTAL SCIENCE  
Frederiksborgvej 399, 4000 Roskilde

**Tuesday 12 July 11:00 am – The Pavillon**



**Prof. José María Monteagudo**

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University of Castilla-La Mancha, Ciudad Real, Spain,*

**Title: “In-situ Chemical Oxidation by Intermediate Oxidative Species”**

**ABSTRACT:** Over the last few decades, Advanced Oxidation Processes (AOPs) have been widely studied because of their effectiveness in the oxidation of organic compounds. The efficiency of AOPs is based on the generation of highly reactive free radicals, especially hydroxyl radicals ( $\cdot\text{OH}$ ,  $E_0 = 2.8 \text{ V}$ ), by various combinations of processes, such as UV/ $\text{H}_2\text{O}_2$ , Fenton, photo-Fenton, ferrioxalate-assisted photo-Fenton, UV/ $\text{TiO}_2$ , UV/ $\text{O}_3$  or any combination of these with ultrasound, and using solar or artificial light. Recently, persulfate anions ( $\text{S}_2\text{O}_8^{2-}$ ,  $E_0 = 2.01 \text{ V}$ ) have received attention as a potentially viable alternative for degrading recalcitrant or hazardous compounds. Due to its aqueous solubility, relatively high stability and low cost, persulfate can be used as a source of an even stronger oxidant, sulfate radicals ( $\text{SO}_4\cdot^-$ ,  $E_0 = 2.6 \text{ V}$ ). Persulfate can be activated by heat (thermally, ultrasound), UV-C light, transition metal ions or  $\text{H}_2\text{O}_2$ . The roles of different intermediate oxidative species, such as singlet oxygen, triplet oxygen, superoxide radical anions and hydroperoxy or hydroxyl radicals greatly affect the mineralization efficacy. An economical study can help us make the better choices.

**SHORT BIO:** Professor Monteagudo was born in Spain. He is currently a Professor of Environmental Engineering at the University of Castilla-La Mancha (Spain) where he teaches courses on unit operations and advanced oxidation technologies for water treatment, physical-chemical processes for atmospheric contamination control and solid waste management. His research interests include advanced oxidation processes for the treatment of wastewaters and drinking water potabilization in developing countries. Dr. Monteagudo is the **author or co-author of over 55 refereed journal publications**, over 40 conference proceedings and 5 book chapter publications. Dr. Monteagudo work received over **900 citations** with an **H factor of 18**. He has currently numerous international collaborations. Dr. Monteagudo has received funding from **40 investigation projects**. He has been Special Issue Editor for the *International Journal of Photoenergy*.

**Host: Professor Kai Bester, ENVS**