

REPORT ON SHORT-TERM SCIENTIFIC MISSION - COST D32

•Visitor

Professor Jose Gonzalez García, from Alicante University to Coventry University, May 2008

•Purpose of the visit

The purpose of the visit was the analysis and checking of collaborative experimental results obtained from joint activities within the COST Action, so as to facilitate the production of outputs that include joint manuscripts to be submitted for publication, also new joint research proposals including proposals for fresh COST Actions. Also discussed were any further necessary experiments to be performed.

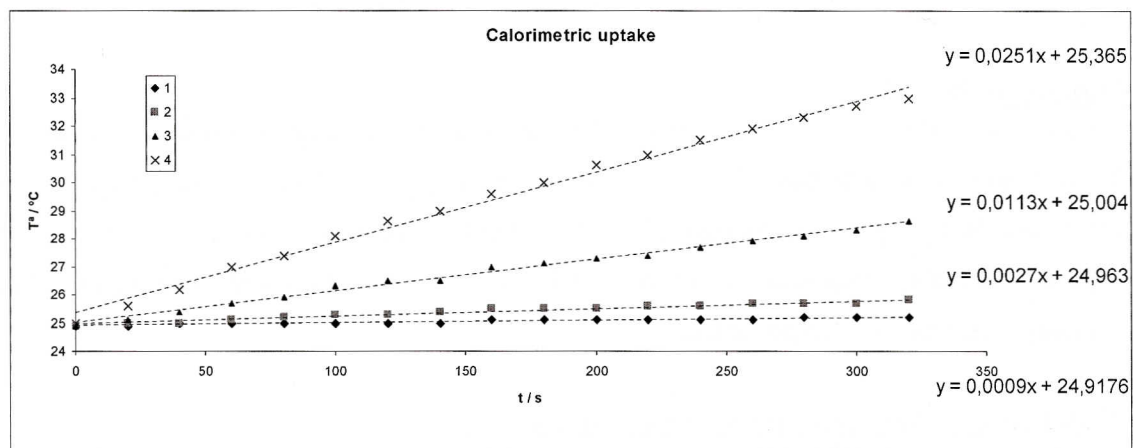
• Description of the work carried out during the visit

Coventry and Alicante laboratories have a strong collaboration, which has been fostered by their COST involvement. As a result an Alicante worker, Ms Veronica Saez, is now at the Coventry laboratory. The collaboration has involved joint studies into the use of ultrasound and/or electrochemistry into the degradation of halo-organic pollutants in water, and where feasible, the identification of reaction mechanisms. In general, Coventry and Alicante have mutual interests in aspects of sonoelectrochemistry and both are members of Working Group 004 in COST D32, which studies this specific topic. The Coventry laboratory is equipped with electrochemical apparatus, and with sonochemical apparatus of a range of different designs. In this way, during the week-long visit, a basis has been established for the sonochemical degradation of perchloroethylene at high frequencies, using specialised 850 KHz apparatus. This work complements previous efforts in the laboratory. Performance tests of the equipment were carried out analyzing the production of OH radicals, effects on temperature increase and watertight compartments of the system.

• Description of the main results obtained

A key point in the study of these compounds is the confirmation of the mass balance. In order to obtain a high reproducibility of experiments, a preliminary test has been carried out in the systems to be used. In the systems have been carried out. The long term equilibrium provided a mass balance error lower than 5% addressing that the system provided the ability for the development of the sonochemical degradation of PCE in order to analyze not only the kinetics of the process but also the mechanism of the degradation due to the lab has all the analytical equipment needed to carry out the analysis. Because that, a work planning for systematic degradation of PCE at higher frequencies by sonochemical methods is being developed for next weeks. Next figure shows the calorimetric tests carried out in the system for four different ultrasound

intensities for a 850 kHz sonochemical reactor. The OH[•] production was estimated around 2.6 μmol/ Lxmin.



• Future collaboration with host institution (if applicable)

A major aim of the STSM was to plan and implement strategic research collaborations, including future COST activities. There is the possibility for a new COST Action to involve enhanced aspects of analytical chemistry, and this was a key topic of discussion. Furthermore, it was decided to apply for a long-period stage grant funded by University of Alicante for Professor David Walton, in order to reinforce the collaboration between two labs.

• Projected publications/articles resulting or to result from the STSM (if applicable)

In addition special attention was paid to the preparation of one or two manuscripts to be sent to peer review journals. These will be jointly-authored and show the strength of the COST contribution to this scientific endeavour. As a first approximation, a talk will be given in the 11ESS Meeting based on the results with the title: "Degradation of chloroethenes in aqueous solution by ultrasound" with the following authors: V. Sáez, M. D. Esclapez, P. Bonete, E. Marchante, J. González-García, D. Walton and O. Louisnard and the related manuscript based on this material will be submitted in the meantime.

• Confirmation by the host institute of the successful execution of the mission

Please find enclosed a confirmatory letter from Dr V Cox, Head of Department at Coventry University.

Signed:

José González García