COST ACTION GREENERING – DATA COLLECTION

First name, Family Name: CABAÑAS ALBERTINA
Type (Academic or Industrial): ACADEMIA
Country: SPAIN
Leadership position in the COST:
Working Group in which you are involved: WG3- Education and Mobility
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Laboratory/Company: Laboratory of Phase Equilibrium and Supercritical Fluids, Department of Physical Chemistry, Universidad Complutense Madrid, Spain**.**

Part of the UCM Group: "Separation and Material Preparation Processes in Sustainable Chemistry Using Supercritical Fluids"

Laboratory/Company info (limited to 400 characters):

Our group is composed of a highly multidisciplinary team from two different departments: Physical Chemistry and Chemical Engineering. We investigate the preparation of composite materials for application in catalysis**,** pharmacology and food industry, using green technologies based on supercritical CO_2. I lead the **Laboratory of Phase Equilibrium and Supercritical Fluids** in the Physical Chemistry dep.

Link to the home page of the Laboratory/Company: https://www.ucm.es/leffs/

Fields of expertise (limited to 400 characters):

- High-pressure phase behaviour involving supercritical fluids and their modelling.
- Metal deposition on planar and porous supports using supercritical CO_2 applied to microelectronics, catalysis and biomedicine.
- Surface modification of materials for CO_2 and metal adsorption.
- Micronization using the Supercritical Antisolvent technique (SAS) for the preparation of drug formulations.

5 Main publications or patents: Selected to cover the different topics

- Cuadra I.A., **Cabañas A.,** Cheda J.A.R., Türk M., Pando C., Cocrystallization of the anticancer drug 5-fluorouracil and coformers urea, thiourea or pyrazinamide using supercritical CO_2 as an antisolvent (SAS) and as a solvent (CSS), J. Supercrit Fluids 159, 104813 (2020).
- E. Sánchez-Miguel, M.J. Tenorio**,** J. Morère y **A. Cabañas**, Green preparation of PtRu and PtCu/SBA-15 catalysts using supercritical CO_2, J CO_2 Utilization 22, 382–391 (2017).

- Y. Sánchez-Vicente, L.A. Stevens, C. Pando, M.J. Torralvo, C.E. Snape, T.C. Drage and **A. Cabañas**, A new sustainable route in supercritical CO_2 to functionalize silica SBA-15 with 3-aminopropyltrimethoxysilane as material for carbon capture, Chem. Eng. J., 264, 886–898 (2015)
- M.J. Tenorio, **A. Cabañas, C**. Pando and J.A.R. Renuncio, Solubility of Pd(hfac)2 and $Ni(hfac)_2.2H_2O$ in supercritical carbon dioxide pure and modified with ethanol, J. Supercrit. Fluids, 70, 106-111 (2012)
- J. Morere, M.J. Tenorio, M.J. Torralvo, C. Pando, J.A.R. Renuncio y **A. Cabañas**, Deposition of Pd into mesoporous Silica SBA-15 using supercritical Carbon Dioxide, J. Supercrit. Fluids, 56, 213-222 (2011)
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Collaborations:

- Prof. Lourdes Calvo (Chem Eng Department, UCM). We belong to the same UCM group.
- Prof. Martyn Poliakoff and Prof. Steven Howdle (University of Nottingham, UK), Prof. M. Türk (Karlsruhe Institute of Technology-KIT, Germany), Dr Katerina Lalatsa (University Portsmouth, UK), Dr. Yolanda Sánchez-Vicente (Northumbria University).

Facilities:

- A 500 ml SAS precipitator (Thar Technology) that operates up to 100°C and 38 MPa.
- 100 mL stirred high-pressure reactorAutoclave Engineers. Temperature: ambient-250ºC.
- Vessels: 10, 30, 50, 70 mL with stirring. Pressure: up to 35 MPa. Temperature: ambient-150 ºC. CO2 flow rate: 1- 100 g/min
- High-pressure spectroscopic cell (1 mL) for IR/UV up to 80 ºC and 30 MPa.
- Variable-volume high-pressure view cell (15 mL) to measure phase diagrams at high pressure.
- Infrastructure for the physicochemical characterization: ASAP Gas adsorption, TGA/DTA, FTIR, UV/Vis spectrophotometer, Shimadzu GC-2010 Plus Gas Chromatograph. Tubular furnace coupled to different gases for heat treatment in a controlled atmosphere. In vitro dissolution apparatus according to EU Pharmacopeia. Through University facilities: X-ray diffraction, electron microscopy (SEM and TEM), thermal analysis, ICP, elemental analysis, Raman, AFM,…