

REQUIMTE, Departamento de Química

Selective Receptor Polymers for Molecular Recognition

Group of Polymer Synthesis and Processing in
Supercritical Carbon Dioxide- www2.dq.fct.unl.pt/scf



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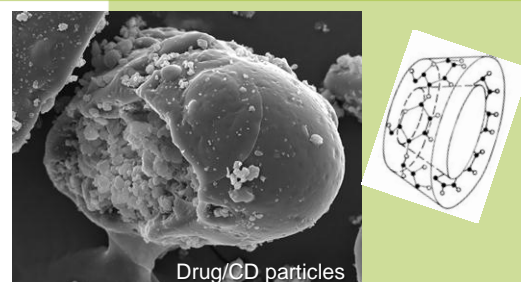
- PhD in Chemistry, UNL, 2003.
- SHIC'11- Solvay&Hovione Innovation Challenge- Hovione Award
- Editor of *Molecular Imprinting*, Versita

Objectives

Molecular recognition processes found in nature have always inspired scientists to mimic these systems in synthetic materials. **Selective receptors** within a polymer have a huge range of applications such as in separation processes, analytical chemistry, sensors, catalysis and drug therapeutics.

Molecular Imprinted polymers (MIPs) and matrixes with host-guest receptors such as **cyclodextrins**, with recognition ability, can respond to new challenges and opportunities.

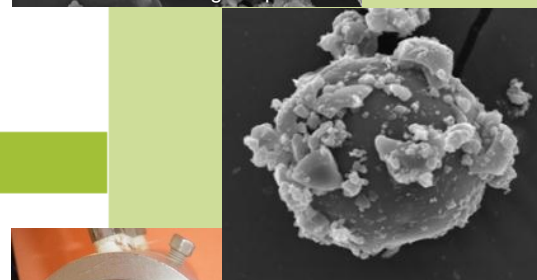
Goal: develop new matrixes using **Supercritical Fluid Technology**. Different applications are being explored through several on-going collaborations.



Drug/CD particles

Methodology

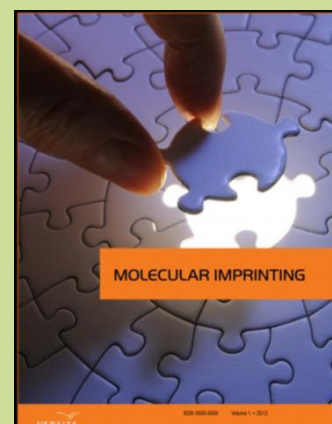
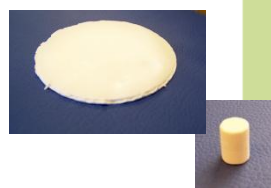
- Molecularly imprinted polymers and cyclodextrin-containing matrixes are developed using supercritical carbon dioxide (scCO₂)-assisted processes.
- Depending on the molecule to which the affinity is wanted, different synthetic or processing approaches can be followed.
- Materials are fully characterized and their performance tested according to the potential application.
- Materials are obtained with controlled characteristics, as dry powders, with no solvent residues, and ready-to-use since no further grinding, drying or purification steps are needed.



MIP particles

Expected Results

- Design new approaches to prepare **molecular imprinted devices** with tailored properties, using clean strategies.
- Confer affinity to porous structures by immobilization of MIPs - **Hybrid materials**
- Explore these affinity materials in processes with interest to the **Pharmaceutical, Fragrance and Petrochemical** industries.
- Development of **prototypes** to be tested with real systems.



Soares da Silva et al., *Bios. Bioelectr.* 25, 2010, 1742; *RSC Advances*, 2012, 2 (12), 5075; *Chem. Eng. Sci.*, 2012, 68, 94; *Int. J. Pharm*, 2011, 416, 61-68.

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