Centro Franco Argentino de Altos Estudios
Universidad de Buenos Aires

Seminario de Posgrado - 32 horas

Del 29 de Mayo al 9 de junio de 2017.
De 09 a 12 hs. Aula 801, Facultad de Farmacia y Bioquímica
UBA Junín 956, 8º Piso.
Inscripción: qai@ffyb.uba.ar o cfaae@rec.uba.ar

« Understanding phase behavior of materials for a sustainable economy»

Profesor invitado
Prof. Ivo RIETVELD
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Profesor anfitrión
Prof. Martin DESIMONE
(UBA)

RESUMEN:

Sustainability of materials is in a large part governed by their phase behavior, because materials tend to evolve to their equilibrium states. Stability of materials can be presented in phase diagrams as a function of the imposed conditions. An important example is the study of the physical and chemical stability of drug molecules as a pure substance and in the dosage form mixture, which constitutes the formulation that a patient will be using for his or her treatment. Understanding the stability behavior of drugs helps formulators to

make the best possible dosage

form, which contains only the necessary quantity of the active pharmaceutical. On the one hand it guarantees the activity of the drug in the human body and on the other hand it prevents the over-usage of drugs, which may cause toxicity and pollution. Moreover, it guarantees the stability of a drug for a given amount of time (shelf life).

The multicomponent phase diagram is a tool to investigate the accumulation tendency of pollutants, such as active pharmaceuticals, in the environment and to investigate how such pollutants can be extracted from dilute solutions in wastewater treatment for example. A clear understanding of solubility, molecular interactions, thermodynamic stability and related phase diagrams is paramount in relation to these questions. In this respect, waste recycling in general is in a large part dependent on the phase behavior of the materials in the waste.

Another example in which phase behavior plays an important role is heat storage materials. They can take up and release heat through their phase transitions contributing to a more economic usage of energy.

These are just a few examples demonstrating that understanding the phase behavior of materials is essential in creating a sustainable economy.

1) An introduction to phase behavior and phase diagrams
2) Understanding phase diagrams from unary to higher order
3) Phase behavior and material properties
4) Crystalline polymorphism
5) Enantiomers, racemates and resolutions
6) Phase behavior of colloids and large molecules, self assembly
7) Applications – heat storage, solubility, flocculation
8) Applications – solubility, supercritical systems
9) Phase behavior of cases requested by participants
10) Presentation of participants work

Bibliografía

H.A.J Oonk, M.T. Calvet, Equilibrium between phases of matter, 2008, Springer, Dordrecht, NL

J.M. Prausnitz, R. N. Lichtenthaler, E. G. de Azevedo, Molecular

thermodynamics of fluid-phase equilibria 1999, 3rd edition, Prentice Hall, New Jersey, USA
J. Bernstein, Polymorphism in Molecular Crystals, 2002, Clarendon Press, Oxford, UK
H.G. Brittain (ed.), Polymorphism in pharmaceutical solids, 1999, Marcel Dekker, NY, USA
J. Jacques, A. Collet, S.H. Wilen, Enantiomers, Racemates and resolutions, 1981, Krieger, Malabar Florida, USA
H.N.W. Lekkerkerker, R. Tuinier (eds.), Colloids and the depletion interaction, 2011, Springer, Heidelberg, GER
J. Israelachvili, Intermolecular & surface forces, 2011, 3rd edition, Academic Press, San Francisco, USA
I.B. Rietveld (ed.), Phase equilibria and their applications, European Physical Journal – Special Topics, 2017, EDP Sciences, Les Ulis, FR

¡INFORMACIONES IMPORTANTES!

Acreditación del seminario

Para poder acreditar el seminario, es necesario cumplir con el 80% de la asistencia y presentar una monografía.
El trabajo final debe ser entregado de la siguiente manera, a menos que los Profesores que dictan el seminario particularicen otra metodología:
-Dentro de 3 meses siguientes a la finalización del seminario.
-Las monografías deberán ser enviadas al siguiente correo electrónico: cfaae@rec.uba.ar
-Una vez corregida por el profesor, el CFAAE confeccionará y entregará los certificados correspondientes.

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