

# VI Iberoamerican Conference on Supercritical Fluids

October 30 to November 2, 2023  
Los Cocos, Córdoba, Argentina



## Pre-conference Course

### Supercritical fluids technology: Fundamentals and natural products extraction and refinement

**Saturday, October 28th – Córdoba City**

#### **DR. PABLO HEGEL**

Pablo E. Hegel graduated in Chemical Engineering (2003) and did his PhD (2008) at Universidad Nacional del Sur (Argentina), focusing on the application of high-pressure technologies for the processing of vegetable oils. He also was Postdoctoral researcher at ENSIACET (France), where he explored the extraction of lipids from yeast using supercritical CO<sub>2</sub>.

Pablo E. Hegel is currently Professor at the Universidad Nacional del Sur in the Department of Chemical Engineering and works as Independent Researcher at PLAPIQUI (CONICET). His main field of research is the development of sustainable processes using supercritical fluids and pressurized liquid solvents, an area that he skillfully complements with the experimental determination of thermophysical properties under extreme conditions. In particular, Dr. Hegel has extensive experience in developing ad-hoc experimental laboratory equipment to investigate the thermodynamic properties of high pressure and supercritical extraction processes. He has carried out research projects for numerous industries, not only in the application of supercritical fluids for the extraction of natural products such as herbs, citrus seeds and cannabis, but also in the processing of oleochemicals.



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## Program (EN):

1. Supercritical fluids fundamentals and properties;
2. Basic thermodynamic cycles in supercritical extraction (pump and compressor modes), power and auxiliary services requirements;
3. Effect of operation variables (pressure, temperature, co-solvents, CO<sub>2</sub> flow rate, extraction time, particle size);
4. Role of solvent density on extraction yield and selectivity;
5. Extraction kinetics (examples of extraction under equilibrium conditions and limited by mass transfer rate);
6. Pre-treatment and its effects on extraction kinetics;
7. Extraction kinetics modeling by simplified methods (models of Sovová);
8. Separators: basic design of operation conditions;
9. Supercritical extraction plant: basic design, main equipment and fitting, auxiliary equipment, practical example of supercritical extraction;
10. Supercritical extraction at bench and pilot plant scale.

## Programa (ES):

1. Fundamentos de fluidos supercríticos y sus propiedades;
2. Ciclos termodinámicos básicos de extracción supercrítica (bomba y compresor), y requerimientos de potencia y servicios auxiliares;
3. Efecto de variables operativas de interés (presión, temperatura, efecto de co-solvente, caudal de CO<sub>2</sub>, tiempo de extracción, tamaño de partícula de matriz vegetal);
4. Rol de la densidad del solvente en rendimiento y selectividad de extracción;
5. Cinética de extracción (ejemplos de extracción bajo equilibrio, extracción con limitación por transferencia de masa);
6. Pretratamientos de material y efecto en las cinéticas de extracción;
7. Modelado de cinéticas de extracción por métodos simplificados (modelos de Sovová);
8. Separadores: diseño básico de condiciones operativas;
9. Planta de extracción supercrítica: diseño básico, equipos principales y conexiones, equipos auxiliares o de servicio, y ejemplo práctico de extracción supercrítica;
10. Ensayo de extracción supercrítica en planta escala banco y piloto.

	<b>Registration fee</b>
PROSCIBA participants	<b>Free</b>
Students	U\$D 50.- / AR\$ 15.000.-
Academics	U\$D 150.- / AR\$ 45.000.-
Others	U\$D 250.- / AR\$ 75.000.-

Registration form: <https://forms.gle/YaGsKyTiDspNUUQf6>