



Supercritical Fluid Technology

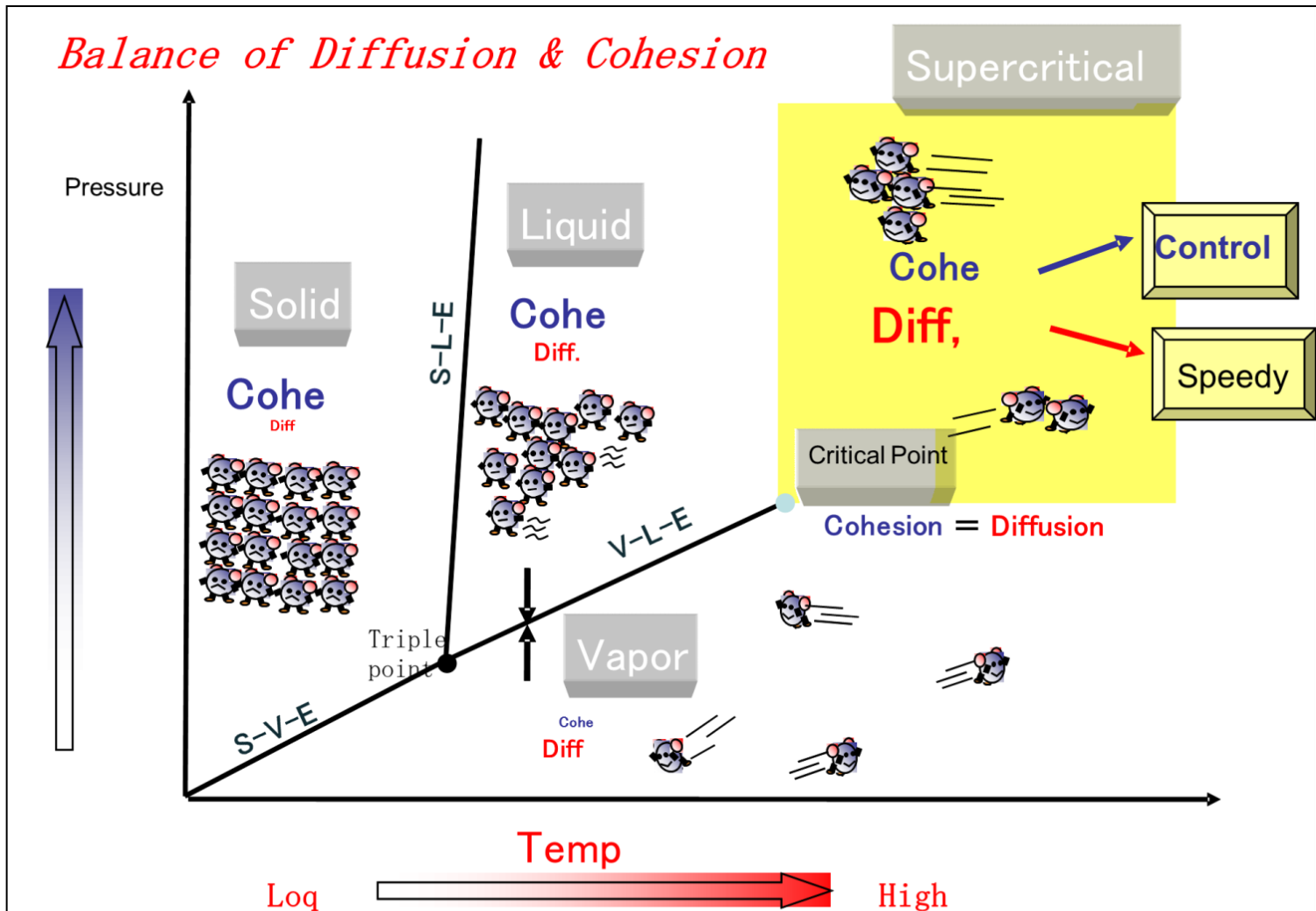
—Cleaning, Functional material preparation—

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What are Supercritical Fluids?

Non-condensable fluids
above its critical temperature and pressure



General features of supercritical fluids

- -Can vary its density continuously from gas-like to liquid-like values.
- - High penetration capability

Property	Gas	SCF	Liquid
Density [kg/m ³]	0.6~2	300~900	700~1600
Viscosity [10 ⁻⁵ Pa·s]	1~3	1~9	100~300
Diffusivity [10 ⁻⁹ m ² /s]	1000~4000	20~700	0.2~2
Kinematic Viscosity [10 ⁻⁷ m ² /s]	100	1~10	10

+ *very low surface tension*

Research Topics on going in Our Group

1: Supercritical Cleaning

Clothes, Precise Metal parts & Filters

2: Catalyst Preparation

3: Polymer Processing (Foaming, Painting)

4: Extraction of Natural Plants

(Citrus Peels, Leaves, Seeds, Algae, etc...)

5: Heavy Oil Conversion

6: Chemical recycle of Polycarbonate (PC)

7: Energy conversion of wet biomass

8: P-V-T and Viscosity measurement

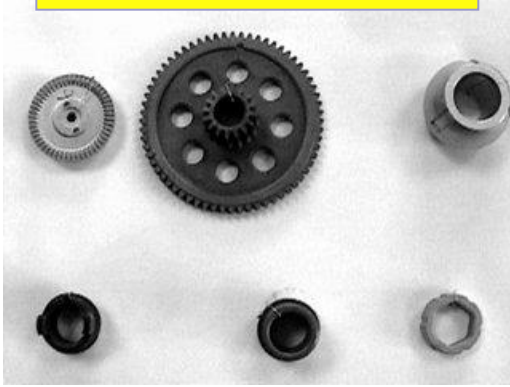
9: High pressure phase equilibrium

10: Solution structure in High Temperature Water

Supercritical CO₂ dry cleaning

- *Pump-less Solvent Circulation Method* -

Metal Parts



Transformer



Coat with Fur



Kimono/Silk Clothes

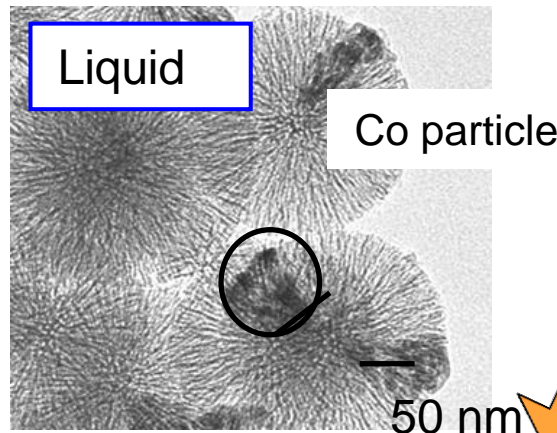
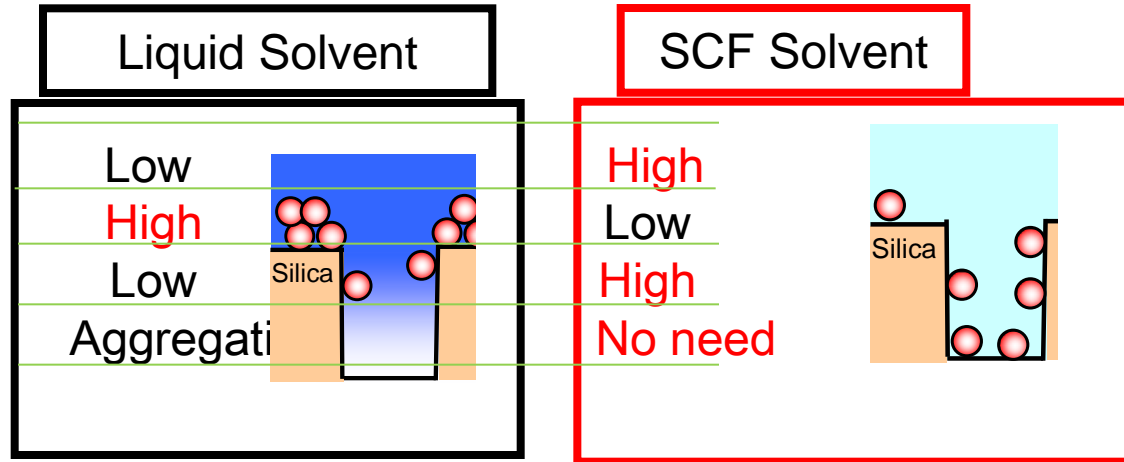


Down Jacket

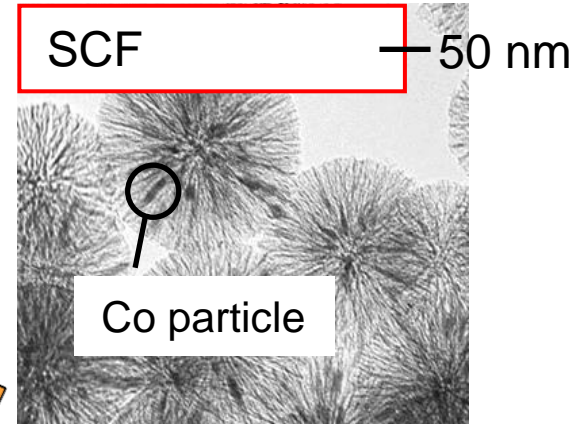


Catalyst Preparation by Supercritical Fluid

Diffusion
Surface tension
Penetration
Drying



High dispersion of metal particles



Efficient Utilization of micro pores

Pt, Rh, Co, Fe, Ni, etc., on
Mesoporous Silica, Zeolite, Carbon, etc...