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Catalyst preparation for fluidized bed reactors by spray drying

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Spray dried core-shell WO_3/TiO_2 catalyst

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Gregory S. Patience



POLYTECHNIQUE
MONTRÉAL

LE GÉNIE
EN PREMIÈRE CLASSE

Micronization

Spray drying

Particle size

Core-shell

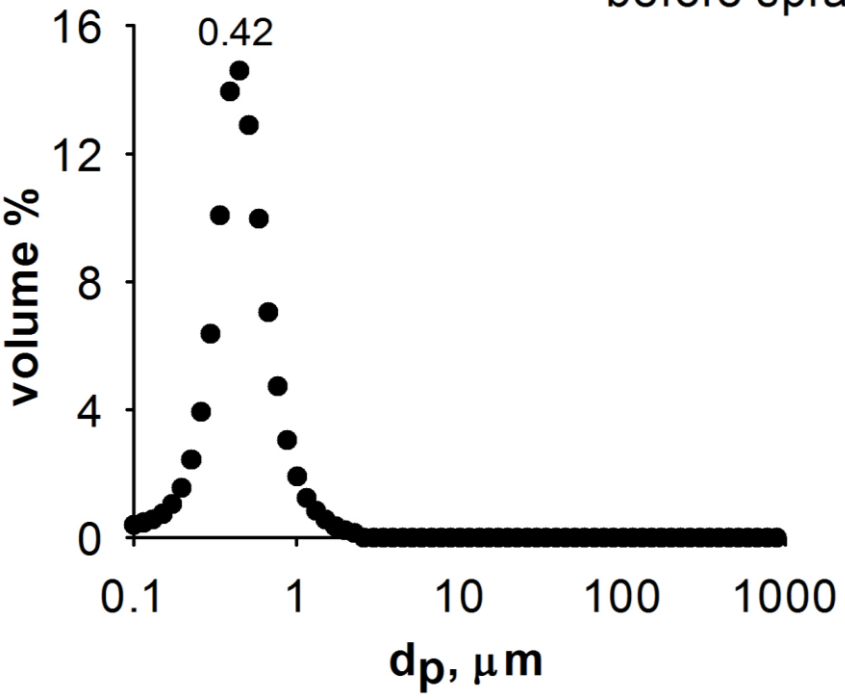


**Manufacture
our own
catalyst at
laboratory scale
<10 g**





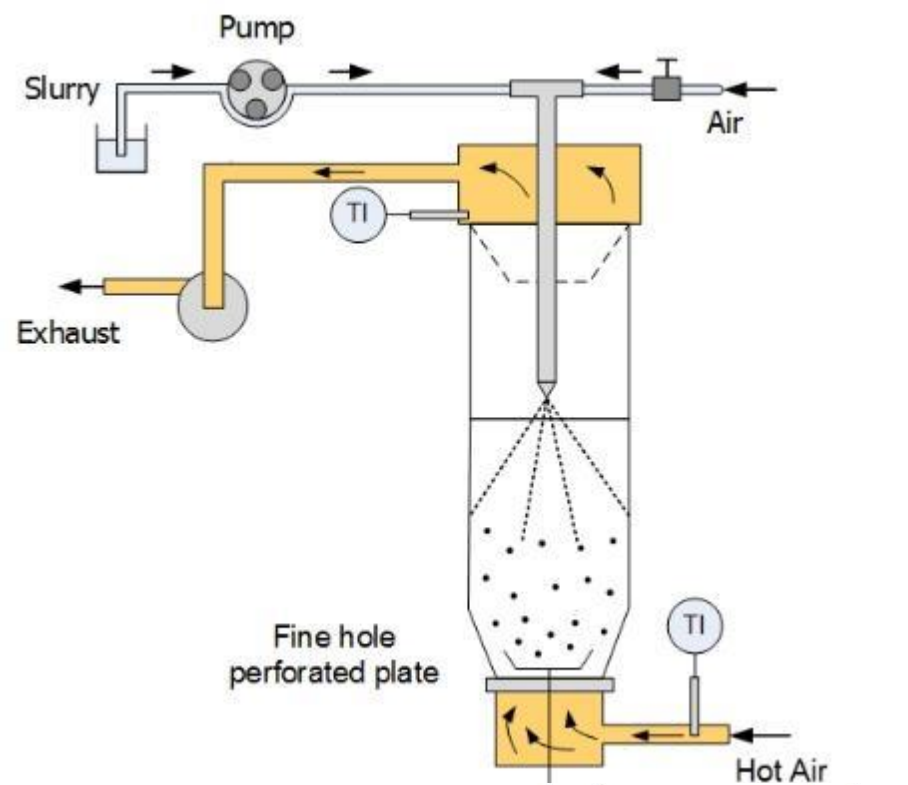
• before spray drying



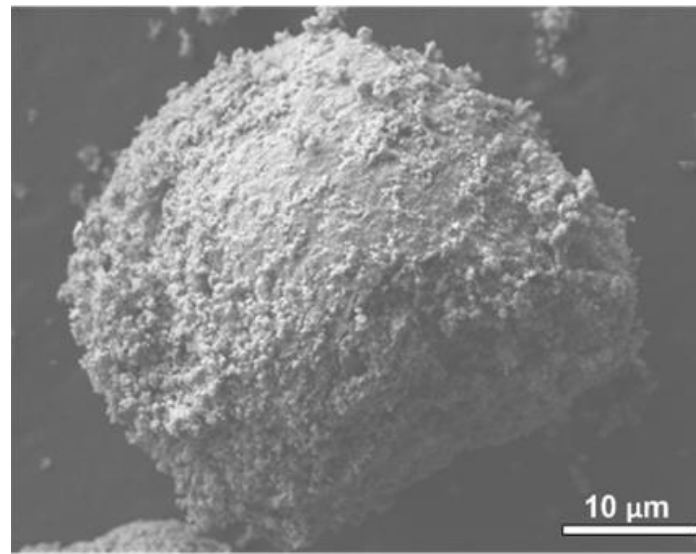
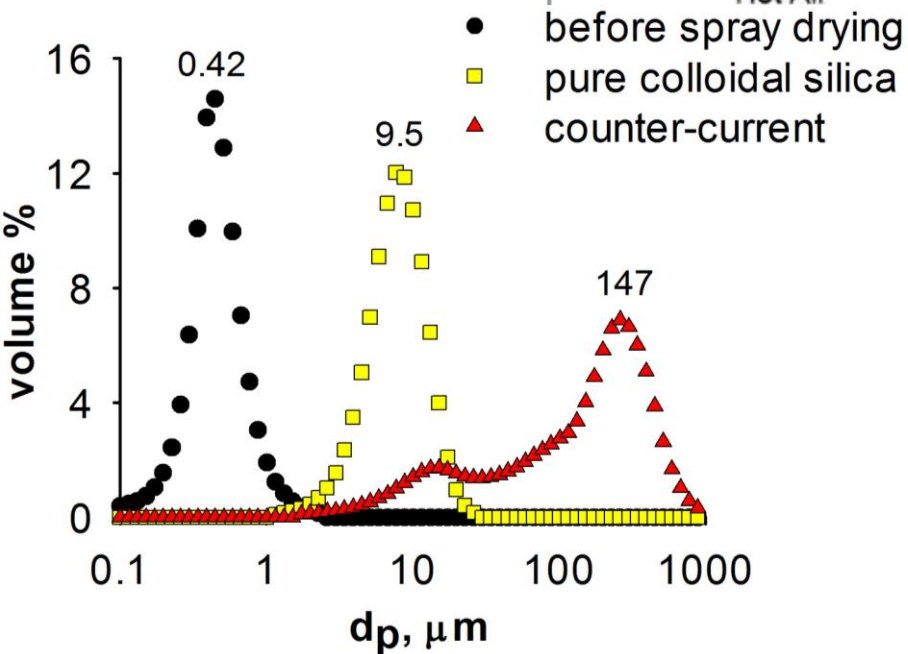
Micronization

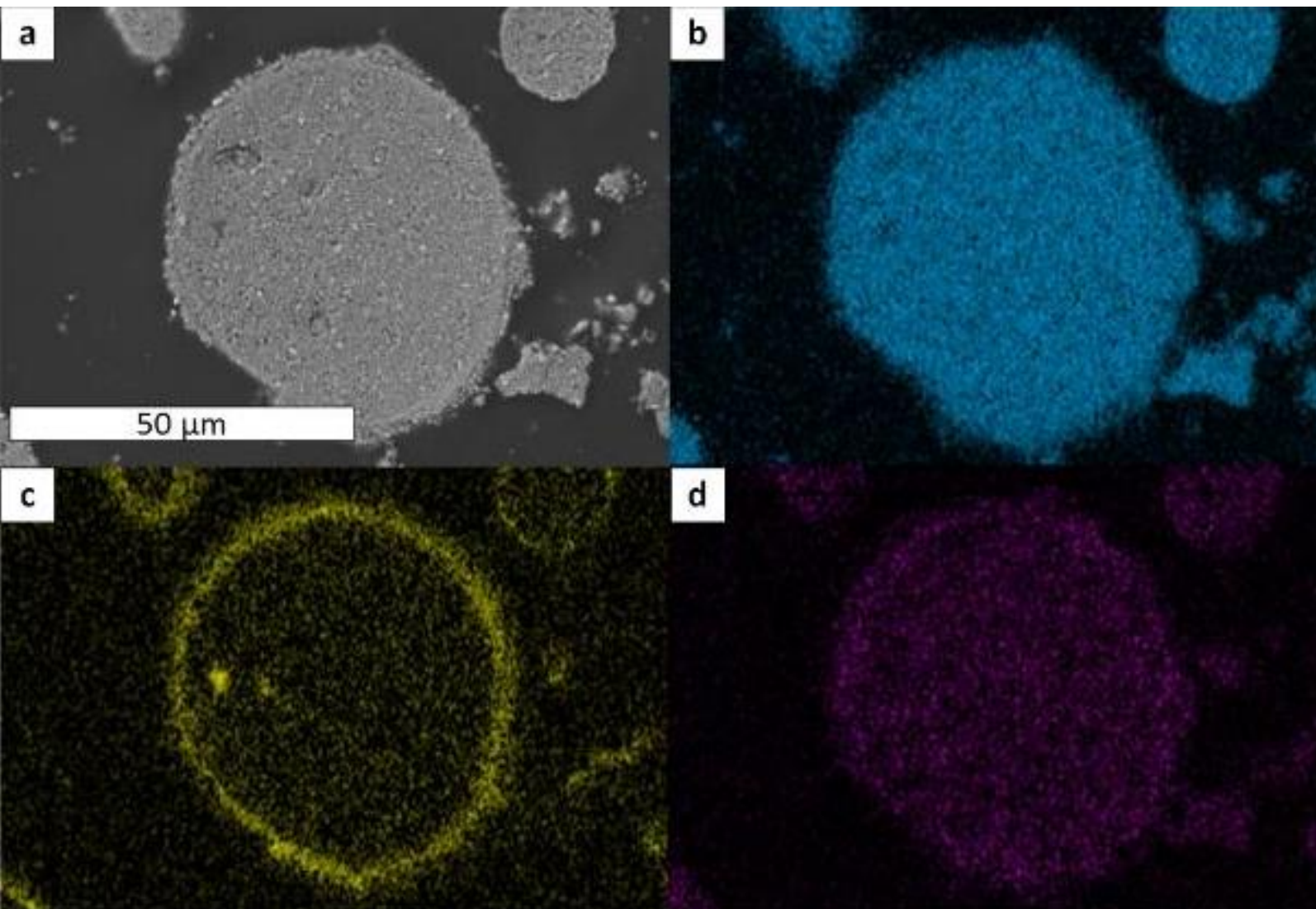
Spray drying

Particle size



- **Binders:**
 - LUDOX
 - PVA
 - H_3PO_4
- **Temperature: 245°C**





Micronization

Spray drying

Particle size

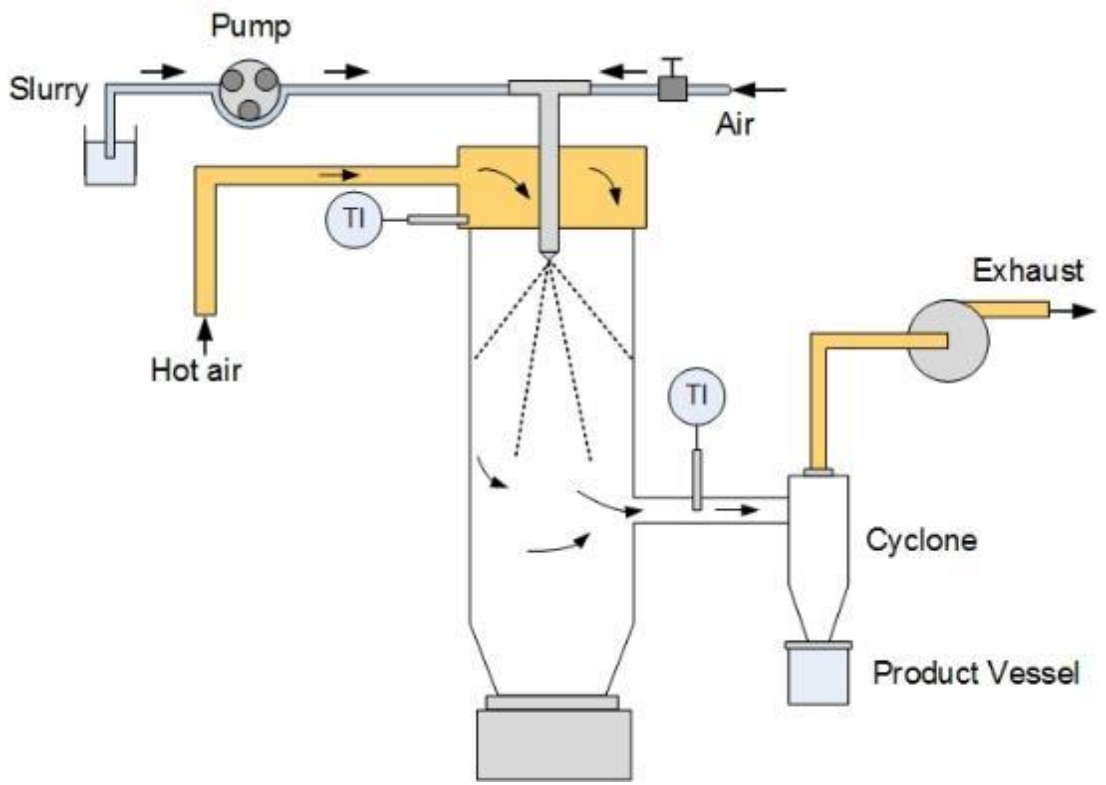
Core-shell

Spray dried core-shell WO_3/TiO_2 catalyst morphology and EDS elemental mapping: a) SEM image, b) Ti, c) Si, d) W

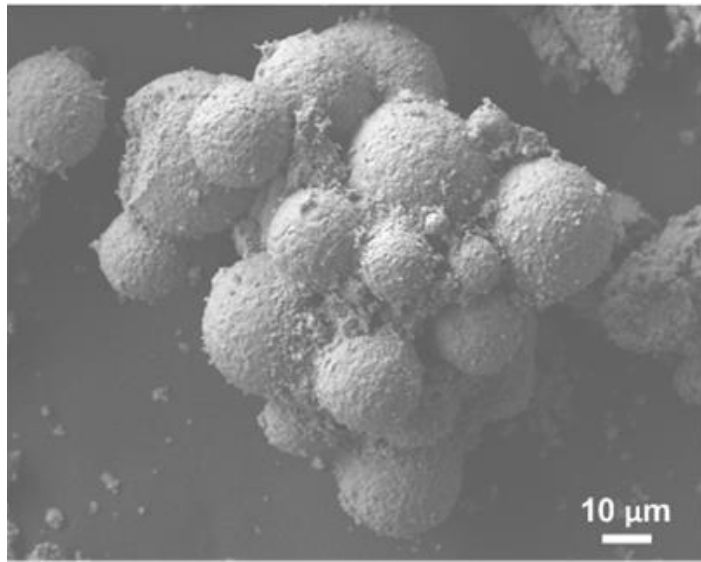
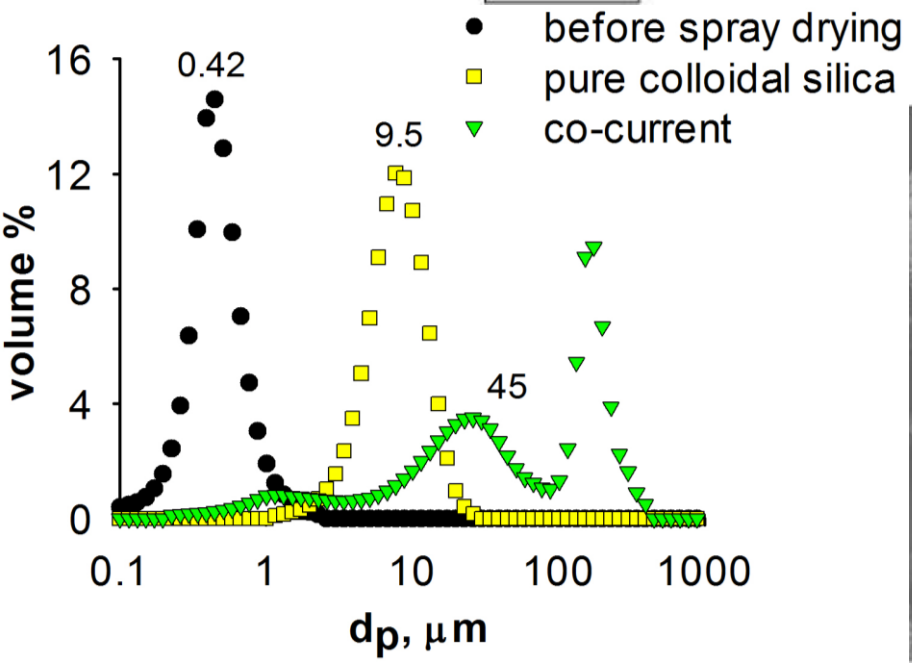
Micronization

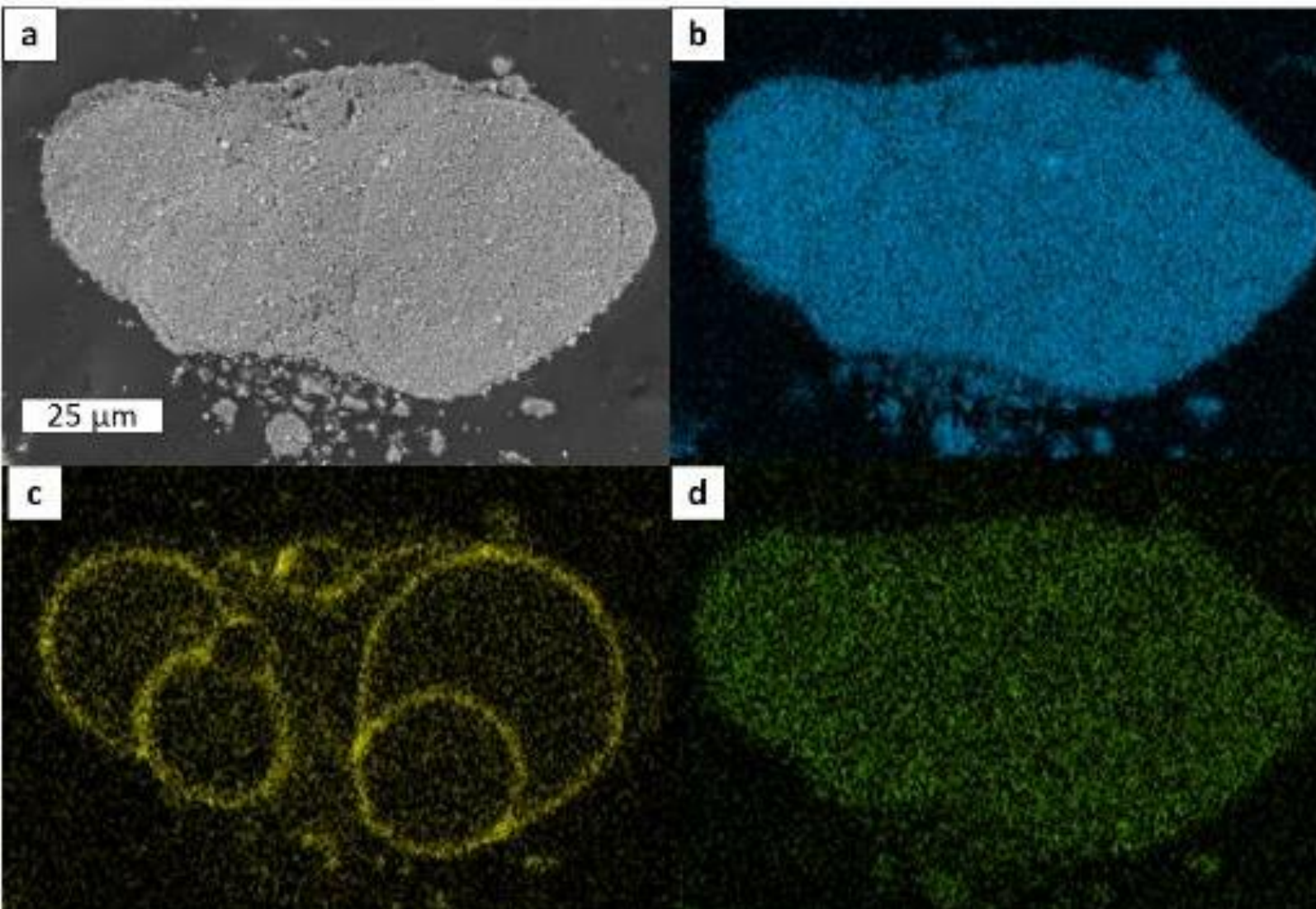
Spray drying

Particle size



- Binders:
 - LUDOX
 - PVA
 - H₃PO₄
- Temperature: 180°C





Micronization

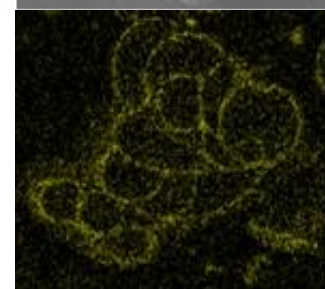
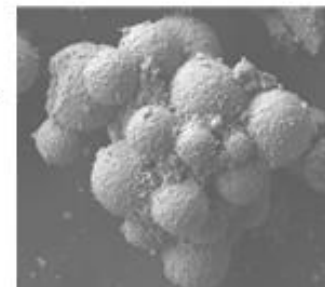
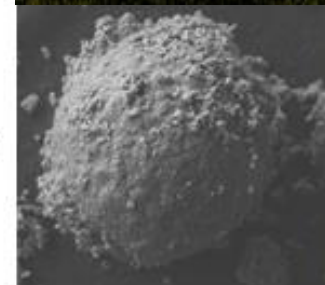
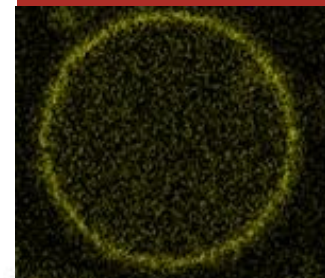
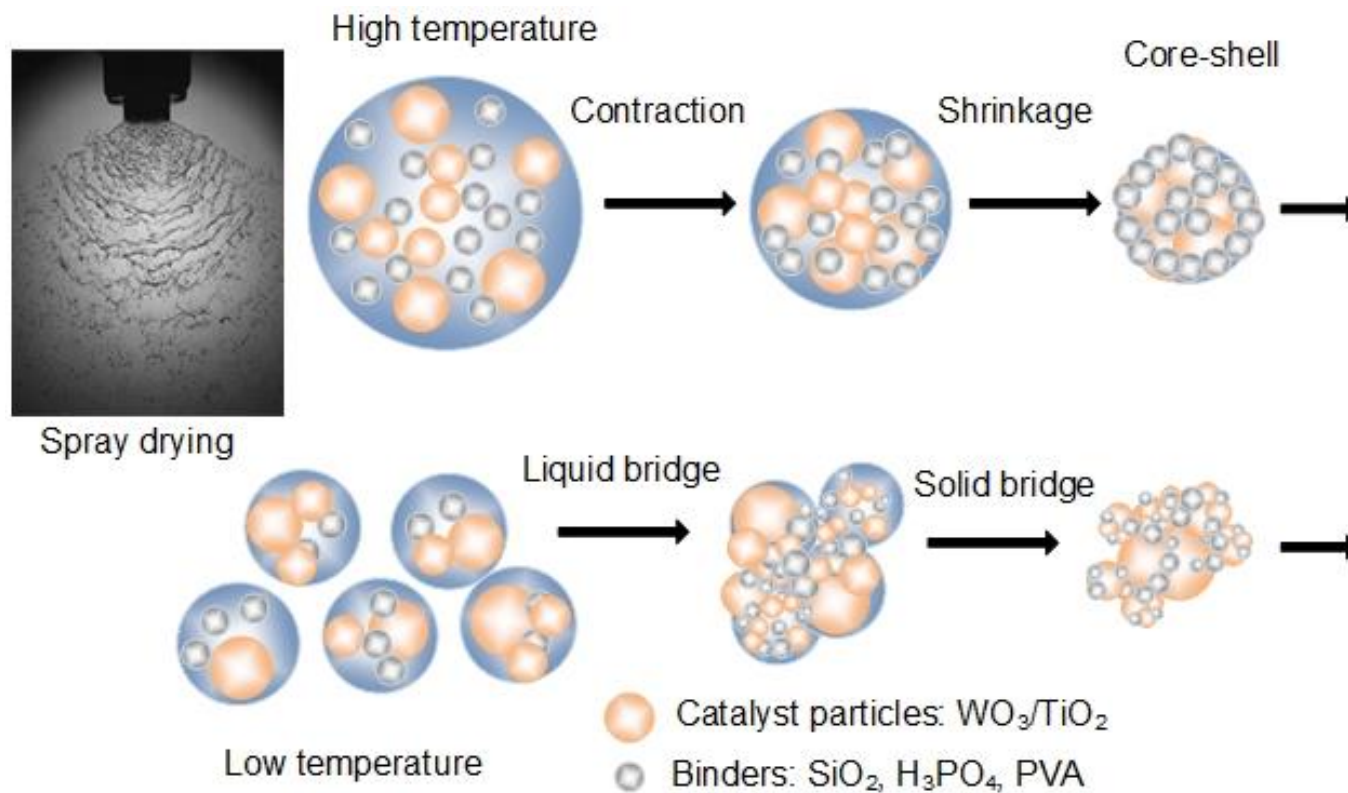
Spray drying

Particle size

Core-shell

Spray dried core-shell WO_3/TiO_2 catalyst morphology and EDS elemental mapping: a) SEM image, b) Ti, c) Si, d) W

- Low T: particles agglomerate
- High T: spherical particles (too high- blow-holes)
- Binder: Ludox, PVA and H_3PO_4



THANK YOU FOR YOUR ATTENTION

