

POWDEROUS COMPOSITES BY HIGH PRESSURE SPRAY PROCESSES FROM SUPERCRITICAL FLUIDS TO THE SMALLEST PRALINE IN THE WORLD

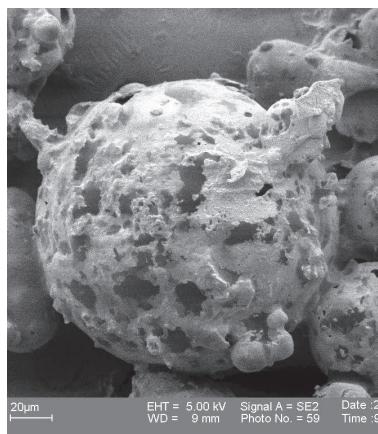
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Supercritical assisted technologies allow generating powders and composites with properties that are difficult or even impossible to establish by classical methods like spray drying or agglomeration. Both conventional spray processes and supercritical processes for particle generation comprise the following steps:

- Melting or dissolution of the substance or mixture to be powderised
- Compressing and dosing of such liquid, supercritical gas and additives
- Admixing pressurised liquid(s), gas(es) and additive(s)
- Droplet formation by expansion in a spray
- Solidification by either evaporation and/or crystallisation and/or agglomeration

The thermo and fluid dynamic properties of systems containing compressed/supercritical gases opened the way to several new methods for particle generation. Specific design criteria for processes and products resulting from the use of supercritical fluids will be discussed for the above described steps.



Solid particle filled with liquid

Possibilities for generating powders and composites with specific application profiles will be shown for food applications (e.g. the smallest praline of the world), reactive systems like powder coatings, high viscous polymers like powderised hotmelts, solid composites with liquid content of up to 90 wt% and for emulsions. Some of the products are already produced in industrial scale.