

Pre-pilot scale preparation of microencapsulation of phase change materials (PCM) at desired temperature range (ambient to 80 °C) using spray dryer technique for building applications (OLP-2305)

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Abstract

Researchers/scientists are preparing MPCM by polymerization technique at the lab level and studying the energy efficiency of the buildings. For prototype building / real building applications, a large amount of MPCM is essentially required. Multiple chemical and physical processes have been used to prepare microencapsulated PCM, including complicated coacervation, sol-gel emulsion, suspension polymerization, pan coating, and spray drying. The above-mentioned chemical processes an intricate number of reagents (surfactants, inhibitors, initiators, monomers, and so on) that are only available in the liquid phase, which increases the expenditure of waste stream treatment and difficult to control the particle size of MPCM. Spray drying, on the other hand, reduces raw material loss used in the chemical process, allowing production of a homogeneous product with a desired particle size distribution (depending on the atomizer design). This technique may also be readily managed and scaled up. Spray drying, among the several approaches, is a promising technique and scales up easily.

Objective:

To prepare 1kg/day of microencapsulation of phase change materials using the spray dryer technique Core (Phase change materials) efficiency up to 95% in the shell (Inorganic)