

Solvent/Non-Solvent Sintering To Make Microsphere Scaffolds

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A solvent/non-solvent sintering technique has been devised for joining polymeric microspheres to make porous matrices for use as drug-delivery devices or scaffolds that could be seeded with cells for growing tissues. Unlike traditional sintering at elevated temperature and pressure, this technique is practiced at room temperature and pressure and, therefore, does not cause thermal degradation of any drug, protein, or other biochemical with which the microspheres might be loaded to

impart properties desired in a specific application. Also, properties of scaffolds made by this technique are more reproducible than are properties of comparable scaffolds made by traditional sintering.

The technique involves the use of two miscible organic liquids: one that is and one that is not a solvent for the affected polymer. The polymeric microspheres are placed in a mold having the size and shape of the desired scaffold, then the solvent/non-solvent mixture is poured

into the mold to fill the void volume between the microspheres, then the liquid mixture is allowed to evaporate. Some of the properties of the resulting scaffold can be tailored through choice of the proportions of the liquids and the diameter of the microspheres.

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