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**An aerosol-spray-assisted approach to produce mesoporous bioactive glass microspheres  
under mild acidic aqueous conditions**

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**Abstract**

A mesoporous bioactive glass in the SiO<sub>2</sub>-CaO system was obtained for the first time by spray-drying an aqueous synthesis solution under mild acidic conditions. The obtained spherical particles showed high surface area and accessible porosity. They also showed a very high bioactivity, leading to the formation of hydroxyapatite and calcite after only 24 h in simulated body fluid. The *in vitro* cell culture results proved that the mesoporous particles are cytocompatible and might enhance the osteogenic differentiation of bone marrow stromal cells as they increased the alkaline phosphatase activity.

The final bioactive mesoporous microspheres can be dispersed in composites in order to impart a high bioactivity and may be used as targeted drug delivery systems.

**Keywords**

Mesoporous bioactive glass, spherical particles, sol-gel, spray-drying, cytocompatibility.

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