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(54) **METHOD OF THE PREPARATION OF FIBRILLAR AND LAMELLAR POROUS MICROSTRUCTURES AND NANOSTRUCTURES BY MEANS OF CONTROLLED VACUUM FREEZE-DRYING OF LIQUID NANOPARTICLES DISPERSIONS**

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**B82Y 40/00** (2013.01)

(58) **Field of Classification Search**

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See application file for complete search history.

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(57) **ABSTRACT**

The invention relates to a method of preparation of lamellar porous microstructures and nanostructures of various density based on controlled vacuum freeze-drying of a liquid dispersion of nanoparticles.

The liquid dispersion of particles is rapidly freeze-dried into solid state inside a tightly closed volume. In this form it is submitted to vacuum freeze-drying with required rate of sublimation of molecules of a liquid dispersion medium, until their total removal, accompanied by the creation of lamellar microstructures and nanostructures.

The orientation of the normal vector of the dominant surface of sublimation interface can be set with regard to the required properties of the final sublimate structure from vertically upwards to vertically downwards. The sublimation rate is adjusted by combination of vacuum depth and external heating of the sublimation interface of the frozen material.

**2 Claims, 3 Drawing Sheets**

