

**NANOCRYSTALLIZATION OF CALCIUM CARBONATE IN MAGNETIC FIELD.**

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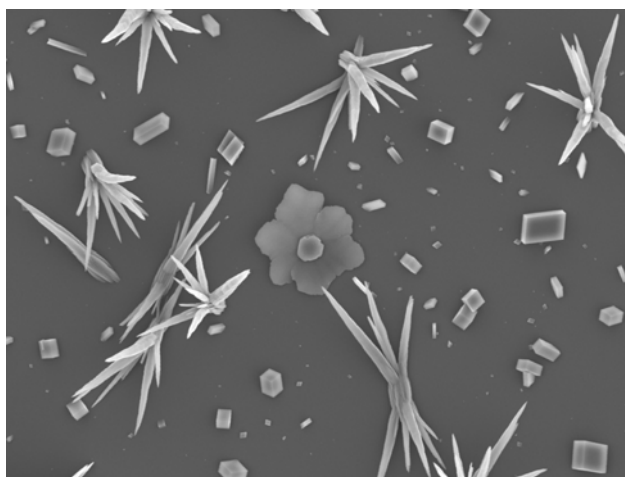
**Abstract.**

The crystallographic point symmetry group of precipitating particles on flow surfaces during the initial stage of nucleation depends besides other factors on the intensity of external magnetic fields and the state of flow during the initial stage of nucleation. Scanning electron microscopy and quantitative X-ray analyses verify that  $\text{Ca}^{2+}$  and  $\text{CO}_3^{2-}$  ions in water flow systems and under constant magnetic field of  $\sim 1.2$  T, precipitate as  $\text{CaCO}_3$  crystals with the ratio of aragonite-vaterite to calcite higher than  $\sim 7$  (Fig. 1). The experimental data can be explained with the application of a quantum mechanical model, which predicts that magnetic fluctuations inside the flow of ionic liquids can be amplified to high values by taking energy from an external magnetic field through the angular momentum of the rotating water molecules. Results are in agreement with recently developed macroscopic magneto-hydrodynamic models of nano-crystallization [1,2].

## References.

[1]Kobe, S.; Dražić, G. ; Cefalas, A. C.; Sarantopoulou, E.; Stražišar, J.; *Cryst. eng.* **2002** 5, 243-253.

[2] Kobe, S.; Dražić, G.; McGuinness, P. J.; Meden, A.; Sarantopoulou, E.; Kollia, Z.; Cefalas, A.C.; *Mater. sci. eng., C, Biomim. mater., sens. syst.* **2003**, 23, 811-815.



**Figure 1.** SEM image of precipitated crystals from water treated with the magnetic field.