

Supplementary information

Paper Ref.: B803564B

Title : Columnar liquid crystals of gibbsite platelets as templates for the generation of ordered silica structures

Synthesis of colloidal Gibbsite platelets

Colloidal gibbsite platelets were synthesized in acidic aqueous solution following earlier described procedures [1, 2, 3]. Hydrochloric acid (HCl 0.09 M, 37%, Merck), aluminium sec-butoxide (0.08 M, 95 %, Fluka Chemika) and 0.08 M aluminium isopropoxide (98+ %, Acros Organics) were added to demineralized water (1 L). This mixture is stirred for 10 days and subsequently heated in a polyethylene bottle in a water bath at 85° C for 72h. After cooling down to room temperature, the dispersion is dialyzed against demineralized water in tubes of regenerated cellulose (Visking, MWCO 12,000–14,000) until the conductivity reaches approximately 20 $\mu\text{S}/\text{cm}$. Next, the smallest particles are removed from the colloidal dispersion by centrifugation at 1100 g (overnight, 15–20 h). This procedure typically yields particles with an average diameter of 200nm.

Growth of large colloidal gibbsite platelets

Colloidal gibbsite platelets can be grown to larger sizes by a seeded growth procedure as described in [4]. Hereto gibbsite particles (39g/L, 52ml) as obtained in the procedure described above were redispersed in aqueous solution of hydrochloric acid, aluminium sec-butoxide and aluminium isopropoxide (1.7L, concentrations similar as described above). The thus obtained mixture is heated at 85° C for 72h while stirred to allow the particles to grow. The resulting colloidal dispersion is cooled down and dialyzed another time against demineralized water. Finally the particles are centrifuged (900g, 2h).

[1] Wierenga, A. M.; Lenstra, T. A. J.; Philipse, A. P. *Colloids and Surfaces A* **1998**, *134*, 359.

[2] van der Kooij, F. M.; Lekkerkerker, H. N. W. *Journal of Physical Chemistry B* **1998**, *102*, 7829.

[3] van der Beek, D.; Lekkerkerker, H. N. W. *Langmuir* **2004**, *20*, 8582.

[4] Wijnhoven, J. E. G. J. *Journal of Colloid and Interface Science* **2005**, *292*, 403.