
Liquid Crystals with Hierarchical Ordering

Liliana de Campo ^{1,2}, Mino Moghaddam ³, Anna Sokolova ¹, Christine Rehm ¹, Rainer Mittelbach ⁴, Trond Varslot ¹, Toen Castle ⁵, Chris Garvey ¹, Nigel Kirby ⁶, and Stephen Hyde ²

¹ Australian Centre for Neutron Scattering, ANSTO, Australia

² Australian National University, Dept Applied Maths, Australia

³ Nanomed, Australia

⁴ ACARA, Australia

⁵ University of Pennsylvania, Dept of Physics, U.S.A.

⁶ Australian Synchrotron, Melbourne, Australia

We present liquid crystal geometries experimentally found for star-polyphilic molecules as the basic building block. Star-polyphiles are small molecules, bearing three mutually immiscible chains attached to a common center [1,2,3]. Like conventional lipids or surfactants (that usually have two immiscible chains), such molecules self-assemble to form lamellar, hexagonal, micellar cubic and bicontinuous cubic structures. However, the presence of the third immiscible chain significantly increases structural complexity and hierarchical ordering can occur.

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[2] de Campo, L., Varslot, T., Moghaddam, M.J., Kirkensgaard, JJK., Mortensen, K., and Hyde, S.T. *PCCP* 2011, **13**, 3139.

[3] de Campo, L., Moghaddam, M.J., Varslot, T., Kirby, N., Mittelbach, R., Sawkins, T., and Hyde, S.T., *Chem. Mat.* 2015., **27** 857.