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Effects of "sponge forming" agents on the sponge to cubic transition ANNELA SEDDON, CHRISTOPHER BRASNETT, HH Wills Physics Laboratory, University of Bristol, Tyndall Avenue, Bristol, BS8 1TL, ADAM SQUIRES, Department of Chemistry, Whiteknights Campus, University of Reading, RG6 6AD, TOMAS PLIVELIC, MAX IV Laboratory, Lund University, 22100 Lund, Sweden — The addition of small molecules to the bicontinuous cubic phase formed by certain lipids can lead to the formation of a disordered bicontinuous phase known as the sponge phase and transitions between the sponge and cubic phase are an excellent route to the formation of highly oriented cubic phases. [1,2] There are a number of small molecules identified which can lead to the formation of a sponge phase; small amphiphiles such as butanediol are partition at the head-tail interface of the lipid, reducing the interface curvature until the sponge phase is formed. Alternatively, chaotropes such as KSCN interact with the headgroup of the lipid preferentially to water, increasing the headgroup area of the lipid and causing a flattening of the membrane. We have studied the sponge to cubic transition under shear for sponges formed from butanediol, and KSCN with the lipid monoolein and find that a far more ordered cubic phase is formed when a chaotrope is used to form the sponge. In addition, we show that depending on dilution of the sponge forming agent, transitions between oriented cubic phases and oriented lamellar phases can be achieved, despite the presence of a disordered intermediate. [1] A.M.Seddon et al, J.Am.Chem.Soc., 2011, 133, 13860 [2] T. Oka, Langmuir, 2015, 31, 3180

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