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Crystallization in Micellar Cores: confinement effects and dynamics REIDAR LUND, THOMAS ZINN, Department of Chemistry, University of Oslo, LUTZ WILLNER, Forschungszentrum Jlich, DEPARTMENT OF CHEMISTRY, UNIVERSITY OF OSLO TEAM, FORSCHUNGSZENTRUM JLICH COLLABORATION — It is well known that liquids confined to small nanoscopic pores and droplets exhibit thermal behavior very different from bulk samples. Here we demonstrate that n-alkanes forming 2-3 nm small micellar cores are considerably affected by confinement in analogue with hard confined systems. We study micelles form by self-assembly of a series of well-defined n-Alkyl-PEO polymers in aqueous solutions [1]. By using small-angle X-ray scattering (SAXS), densiometry and differential scanning calorimetry (DSC), we show that n-alkane exhibit a first-order phase transition i.e. melting. Correlating the structural and thermodynamic data, we find that a melting depression can be accurately described by the Gibbs-Thomson equation [2]. \f1 The effect of core crystallinity on the molecular exchange kinetics is investigated using time-resolved small-angle neutron scattering (TR-SANS) [3-6]. We show that there are considerable entropic and enthalpic contributions from the chain packing that affect the kinetic stability of micelles. [7]\pard[1] T. Zinn *et al.*, *Soft Matter*, 2014, **10**, 5212.\pard[2] T. Zinn, L. Willner and R. Lund, *Phys. Rev. Lett.* **113** (2014) 238305.3] R. Lund, L. Willner, D. Richter, *Adv. Polym. Sci.* **204** (2013) 51.5] R. Lund *et al.* Phys. Rev. Lett., 2006, 96, 068302.6] S.-H. Choi *et al.* *Phys. Rev. Lett.* 104 (2010) 1.7] T. Zinn, L. Willner, V. Pipich, D. Richter and R. Lund, *ACS Macro Lett.*, 2015, **4**, 651–655.

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