Canadian Association of Physicists | Association canadienne des physiciens et physiciennes

Contribution ID: **1577** Type: **not specified**

Spherical packing phases of block copolymers

Sunday, 28 May 2017 10:00 (15 minutes)

Block copolymers, which are composed of two or more chemically distinct sub-chains or blocks, could self-assembled to form various ordered phases. Among the block copolymer phases, the spherical packing phases are of particular interest because it resembles the familiar atomic crystals. For a very long time, it had been believed that the stable spherical phases of diblock copolymers are mainly of body-centered-cubic (BCC) symmetry. Recent experiments have shown that more complex spherical packing phases, such as the A15 and Frank-Kasper σ-phase, could become equilibrium phases of diblock and tetrablock copolymers. We have carried out a systematic study to understand the mechanisms stabilizing these complex spherical packing phases. We demonstrated that the A15 and Frank-Kaspe σ-phases could be stabilized in various polymeric systems. Furthermore, we revealed that a generic mechanism to stabilize the complex spherical packing phases is the formation of nonspherical domains with different sizes, which could be achieved in various molecular formulations such as conformational asymmetry, topological architectures, and polydispersity distribution of macromolecules.

Primary authors: SHI, An-Chang (McMaster University); Dr LI, Weihua (Fudan University); Dr LIU, Meijiao (McMaster University)

Presenter: SHI, An-Chang (McMaster University)

Session Classification: Soft Matter Canada 2017 / Matière molle Canada 2017

Track Classification: Soft Matter Canada 2017