

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Mesoscopic Archimedean Tiling Patterns in ABC Star-Shaped Terpolymers** ATSUSHI TAKANO, KENICHI HAYASHIDA, Nagoya University, TOMONARI DOTERA, Kyoto University, YUSHU MATSUSHITA, Nagoya University — Microphase-separated structures formed by ABC star-shaped terpolymers were investigated by transmission electron microscopy (TEM), electron tomography (3D-TEM), and small-angle X-ray scattering (SAXS). The samples are composed of polystyrene (S), polyisoprene (I) and poly(2-vinylpyridine) (P), their volume ratios of I:S:P are 1:1:X, where  $0.2 < X < 4.9$ . From morphological observations by TEM, it was found that ISP stars show characteristic cylindrical structures when X is within the range  $0.7 \leq X \leq 1.9$ . By the careful investigation of the ISP stars by TEM and 3D-TEM, it was confirmed that the cross-sections of cylindrical structures of four samples show two-dimensional tiling patterns consisting of regular polygons, that is, [6.6.6], [4.8.8], [3.3.4.3.4], and [4.6.12], which are families of the Archimedean tiling patterns. Furthermore the SAXS patterns of four samples are quite consistent with structural observation of TEM.

Atsushi Takano  
Nagoya University

Date submitted: 18 Nov 2006

Electronic form version 1.4