Single Crystalline Morphology and Lamellar Assembly in Thin Films of Poly(1,6-hexamethylened adipate)/Poly(vinyl methyl ether) Blend

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**PHA** $M_w = 11,000$ g/mol, $T_g = -65$ °C, $T_m = 55.3$ °C.

- 2006, Gestí S. et al. 
**Orthorhombic** unit cell/ zigzag planar conformation (all-trans) (WAXD & ED pattern result) 
$(a = 1.008$ nm, $b = 1.464$ nm, $c = 1.683$ nm), 8 chains/cell.

**PVME** $M_w = 96,700$ g/mol, $T_g = -22.5$ °C

- 2010, Woo E. M. et al. 
**Miscible phase behavior** of water-soluble PVME blends with PHA. 
Interaction parameter ($\chi_{12}$) = -0.21 (DSC analysis)

**Method**

**Sample preparation:** solvent blending (PHA/PVME = 80/20) >> spin coating/drop casting on glass slides (well dry) >> melt-crystallization

**Sample observation:** polarized optical microscopy (POM) / atomic force microscopy (AFM) / electron diffraction (ED)

**Results**

In **ultrathin film state (~200 nm)**

\[ T_c = 38 \, ^\circ\text{C} \]

\[ T_c = 46 \, ^\circ\text{C} \]
**Results**

In **thin film state (2-3 μm)**

- **T_c = 38 °C**
  - POM
  - Height image
  - Phase image

- **T_c = 46 °C**
  - POM
  - Height image
  - Phase image

In lower T_c sample, the AFM phase image shows that both edge-on and flat-on lamellae are the main species in negative-birefringence spherulites with random arrangement. However, in higher T_c sample, only flat-on lamellae exist in its positive-birefringence spherulites.
**Results**  
In thin film state (2-3 \( \mu \text{m} \))

\[ T_c = 46 \, ^\circ\text{C} - \text{1 min} - 38 \, ^\circ\text{C} - \text{0.2 min cycled} \]

Main concept of this study:  
The alternating ring bands can be packed with mechanisms different from the conventionally thought continuous spiral of a continuous lamella.