

Abstract Submitted
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Co-crystallization of Alkanes with Longer Methylene Segments within a Statistically Random Copolymer JEFFREY KALISH, University of Massachusetts-Amherst, SURIYAKALA RAMALINGHAM, YUNING YANG, SHAW LING HSU, University of Massachusetts-Amherst, HENKEL COLLABORATION — Binary blends of alkanes (C_nH_{2n+2} , $n=24, 32, 36$) and statistically random ethylene-co-vinyl acetate (EVA) copolymers with different vinyl acetate (18, 28 and 40%) contents have been studied to understand the phenomenon of co-crystallization of longer chain fractions. Using thermal fractionation, the distribution of various crystallizable ethylene chain sequences was established in EVA copolymers. Co-crystallization in blends was observed by changes in spectroscopic features of various unit cells (triclinic, even $n < 26$; monoclinic, even $n > 26$ and orthorhombic, odd n) using vibrational spectroscopy. In order to distinguish these changes, deuterated alkanes were blended with EVA. Orthorhombic unit cells show a doublet in the C-H rocking region due to crystal field splitting; this splitting was removed upon co-crystallization. In Raman spectra, the Longitudinal Acoustic Modes (LAM) are used to validate co-crystallization. LAM did not change significantly when an alkane was co-crystallized with EVA in comparison to the neat alkane. The Raman C-H stretching region changed when a monodispersed alkane was blended. Thermal and X-ray analysis support these spectroscopic results upon co-crystallization.

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