

Abstract Submitted  
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**Entropy of Mixing: Rigid vs. Flexible Molecules: Effect of Varying Solvent on Dissolution Temperature** ERIC B. SIROTA, ExxonMobil Research and Engineering Company, HASNAIN RANGWALLA, ExxonMobil Chemical Company, PAWEL PECZAK, ExxonMobil Research and Engineering Company — We report a study of the dissolution temperature of n-hexacontane, as a function of concentration, with 52 different solvents, aimed at understanding the effect of molecular flexibility on the entropy-of-mixing. The entropy-of-mixing of rigid molecules is commonly expected to go as  $\ln(\text{mole fraction})$ , while for flexible polymers it is expected to follow Flory-Huggins  $\ln(\text{volume fraction})$ . By isolating the entropy-of-mixing, we have experimentally found that rigidity, through ring structures, causes deviations from the Flory-Huggins behavior; and we have proposed and derived a cross-over form for the entropy-of-mixing which varies between  $\ln(\text{volume fraction})$  and  $\ln(\text{mole fraction})$  according to molecular rigidity

Eric B. Sirota  
ExxonMobil Research and Engineering Company

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