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Monolayers of Carboxylic Acids at the n-Hexane-Water Interface
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Introduction: Water-oil interfaces are a model for the interaction of water with a hydrophobic molecular environment, important for protein folding and the formation of structures in complex fluids. In this work we continue our study of soluble monolayers of simple long-chain organic molecules (see Ref. 1).

Methods and Materials: We used interfacial tension measurements to prepare systems with adsorbed monolayers of long-chain carboxylic acids (eicosanoic acid and triacontanoic acid). Both are slightly soluble in oil. X-ray reflectivity was used to obtain the electron-density profile across the hexane/water interface and to analyze the structure of the monolayers.

Results: The reflectivity curves for C30-acid monolayers at different temperatures are depicted in the Figure. The profiles of the electron-density revealed two-layer structures of the monolayers similar to those we observed for the monolayers of long-chain alcohols. The packing of the C30-acid molecules in the monolayer is significantly more ordered than for C30-alchohol. Surprisingly, the critical behavior of the acid monolayers with temperature is drastically different from that observed for alcohols [2], and fluorinated films [3].

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References:
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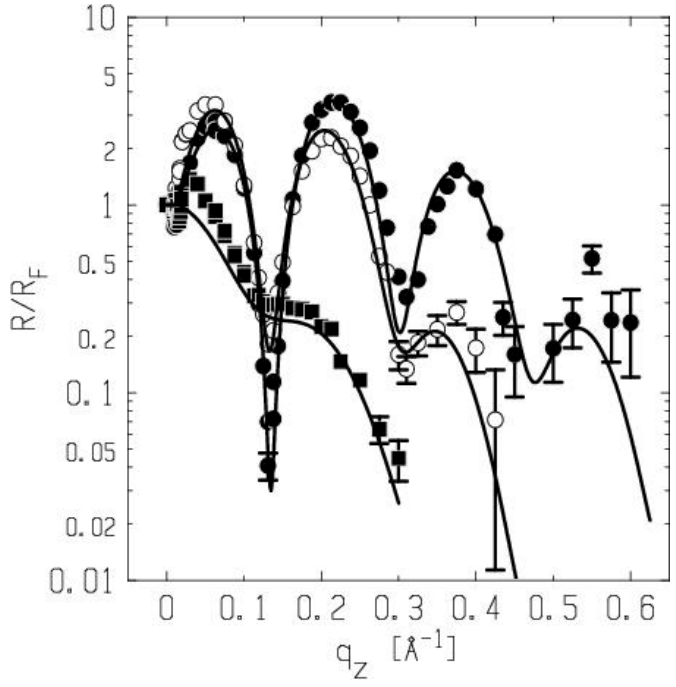

Figure. Reflectivity normalized to the Fresnel reflectivity from the n-hexane/water interface with an adsorbed monolayer of C30-acid at 20 °C (dots), 40 °C (opened circles) and 60 °C (squares). Solid lines are fits based on two-layer model that takes into account temperature dependence of coverage.