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**Scanning Tunneling Microscopy Study of Molecular Structure:  
Controlled Monolayer Formation on Graphite at the Liquid-solid Inter-  
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— The self-assembly of heptadecanoic acid **1** and racemic 2-bromoheptadecanoic  
acid **2** mixtures on the basal plane of a graphite surface has been studied using  
scanning tunneling microscopy at the liquid-solid interface. The domain structure  
varies as a function of the ratio of coadsorbed molecules. At lower concentration  
of acid **2**, heptadecanoic acid controls the surface structure by forming a template  
with fixed lamellar axis-molecular axis angle and domains with alternating R- and  
S-enantiomer molecular rows. Increasing the concentration of acid **2** leads to the  
segregation of chiral domains. The inter-correlation between heptadecanoic acid  
and 2-bromoheptadecanoic acid determines the 2D chiral configuration in the mixed  
monolayer. A model based on energetically favorable molecular conformations is  
proposed and will be discussed.

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