

Abstract Submitted
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Mixing in a Solid Monolayer: SF₆ + C₂F₆ on Graphite¹ G. B. HESS, Univ. of Virginia, B. L. ELLIS, YIZE LI — We have studied mixing of SF₆ and C₂F₆ in a solid monolayer film on graphite by admitting one gas to the cell to a pressure between monolayer condensation and saturation, then slowly admitting the other gas. The total coverage is monitored by ellipsometry and the condition of the individual adsorbates is determined by infrared absorption spectra. In particular, shifts in absorption lines due to dynamic dipole coupling indicate the local environment of molecules of each species. At 75 and 80 K there is no detectable solubility of C₂F₆ in a dense SF₆ monolayer, then a layer of nearly pure C₂F₆ condenses on top. At 86 K there is limited solubility of C₂F₆ in dense SF₆, followed by appearance of a second C₂F₆-rich phase in the monolayer. At 90 K and above, C₂F₆ appears to replace SF₆ by continuous substitution; thus there appears to be a 2-D solid consolute critical point near 90 K. If SF₆ is added to a higher-temperature, low-density C₂F₆ layer, the C₂F₆ molecules are rapidly compressed from flat or tilted orientation to axes perpendicular to the substrate, then are continuously diluted.

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