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Binary mixture study of CF\textsubscript{4} and CF\textsubscript{3}Cl on graphite\textsuperscript{1} PETROS THOMAS, DANIEL VELAZQUEZ, GEORGE HESS, University of Virginia — In a binary mixture adsorption study of CF\textsubscript{4} and CF\textsubscript{3}Cl on graphite from 60 K to 105 K, both the CF\textsubscript{3}Cl - $\nu_4$ and the CF\textsubscript{4} - $\nu_3$ frequency shifts are measured using IRAS as the spreading pressure (chemical potential) of CF\textsubscript{4} is increased. Even though CF\textsubscript{3}Cl has a much lower saturation vapor pressure (SVP) compared to CF\textsubscript{4} (at 80 K, SVP of CF\textsubscript{4} is $\sim$ 70 mT and that of CF\textsubscript{3}Cl is $\sim$ 0.1 mT), the CF\textsubscript{4} either continuously displaces or adsorbs on top of CF\textsubscript{3}Cl depending on the initial coverage of CF\textsubscript{3}Cl on the graphite surface. For temperatures between 70 K and 105 K and lower coverage of CF\textsubscript{3}Cl, where the molecules lie with their C – Cl axis nearly parallel with the surface, CF\textsubscript{4} continuously displaces CF\textsubscript{3}Cl from the surface. For saturated monolayer coverage of CF\textsubscript{3}Cl, where the C – Cl axis of the molecules are tilted relative to the surface, the CF\textsubscript{4} molecules adsorb on top of the CF\textsubscript{3}Cl – HOPG template. At 60 K, the displacement of the low-coverage CF\textsubscript{3}Cl is only partial and the orientation of the remaining CF\textsubscript{3}Cl is tilted relative to the surface from a nearly flat position.

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