Abstract Submitted
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A comparative study of phase separation dynamics of sulfur hexafluoride under fine and coarse temperature quenching in microgravity[1] CATHLEEN WISE, ANA OPRISAN, SORINEL A. OPRISAN, College of Charleston, JOHN J. HEGSETH, University of New Orleans, CAROLE LECOUTRE, YVES GARRABOS, University of Bordeaux, DANIEL BEYSENS, University of Grenoble — Phase separation is determined by thermal quenches that break the symmetry of the homogeneous supercritical phase and leads to the formation of inhomogeneous structures with important implications for the mechanical, thermal, and electrical properties of materials. Sulfur hexafluoride (SF6) heated about 1 K above its critical temperature then quenched below the critical temperature formed gas and liquid domains in microgravity conditions. Full view and microscopic view images were analyzed to determine the changes in the size distribution of droplets. For the first time, we provided experimental evidences regarding the existence of dimple and nose coalescence mechanisms in pure supercritical fluids under microgravity conditions. We recorded data for two different thermal quenches of 3.6 mK and 0.3mK, respectively. Our results indicate that, during the late stage of phase separation, the number of the liquid clusters decreases due to the coalescence events. We estimated the power law growth of the droplets/clusters and fitted it to a universal curve.

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