

Virtual ACOM Seminar

Sulfuric acid-driven new particle formation in the atmosphere

Coty Jen

Carnegie Mellon University
Department of Chemical Engineering

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Links: <https://operations.ucar.edu/live-acom>

ABSTRACT

Clouds influence climate and cool the planet by reflecting incoming sunlight away from the Earth's surface. The extent and brightness of these clouds depend on the composition and concentration of atmospheric particles, the starting point for cloud droplet formation. The majority of atmospheric particles originate from a process known as nucleation, whereby low volatility, gaseous precursors react to form stable clusters (~1 nm diameter). Sulfuric acid is essential for atmospheric nucleation and in continental regions originates primarily from anthropogenic activities. Experimental evidence is presented demonstrating how sulfuric acid reacts with a wide variety of compounds to form stable particles at different rates. A semi-empirical sulfuric acid nucleation model is presented to capture how complex mixtures can synergistically enhance nucleation rates not reflected in current models.