New Approaches for Studying the Chemical Transformations of Organic Particles

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Molecular weight growth and decomposition chemistries play important roles in the transformation of particles from soot formation to atmospheric aerosol oxidation. Understanding these complex reaction pathways requires novel methods of analyzing particle phase hydrocarbons. We are developing a suite of synchrotron-based tools to provide better insights into the molecular composition, isomer distribution, and elemental composition of complex hydrocarbon mixtures, aimed at developing simple yet realistic descriptions of molecular weight growth and decomposition that occur during a heterogeneous reaction.