

Aerosol Optical Properties Derived using Optical Spectroscopy

Kyle J. Zarzana^{1,2} and Margaret A. Tolbert^{1,2}

¹*Department of Chemistry and Biochemistry, University of Colorado Boulder*

²*Cooperative Institute for Research in Environmental Sciences*

A large fraction of aerosol is composed of organic compounds and understanding how these compounds interact with light is crucial to understanding their role in affecting climate. The bulk of organic aerosol is non-absorbing, but a significant fraction is composed of compounds that absorb at shorter wavelengths. The amount of light that a compound absorbs and scatters can be quantified using the complex refractive index, $m = n + ki$, where the real part n describes the scattering and the imaginary part k describes the absorption. While the refractive index cannot be directly measured, optical methods such as photoacoustic spectroscopy and cavity ring-down spectroscopy can be used in tandem to retrieve the refractive index. In this work details of the retrieval method will be presented, along with refractive indices for compounds formed via the reaction of glyoxal with ammonium sulfate, which could be a potential source of absorbing organic aerosol in the atmosphere.