Atmos. Chem. Phys. Discuss.,
doi:10.5194/acp-2017-276-RC2, 2017

Atmospheric Chemistry and Physics
Discussions
Open Access

Interactive comment on "A Complete Parameterization of the Relative Humidity and Wavelength Dependence of the Refractive Index of Hygroscopic Inorganic Aerosol Particles" *by* Michael I. Cotterell et al.

Anonymous Referee #2

Received and published: 8 May 2017

I have read the article "A Complete Parameterization of the Relative Humidity and Wavelength Dependence of the Refractive Index of Hygroscopic Inorganic Aerosol Particles" by the authors Cotterell et al. submitted to Atmos. Chem. Phys. Discuss. This paper provides the refractive indices for aerosol particles composed of salt and water using several atmospherically relevant salts as a function of relative humidity from 100% RH to the efflorescence of the salt. Several wavelengths in the visible were used and dispersion coefficients were derived to obtain the refractive index at intermediate values. The significance of the article is summarized in section 4 "these ...[data] represent the most comprehensive description of refractive index for atmospherically

Printer-friendly version

Discussion paper

relevant inorganic aerosol, fully characterizing the RI variation with both visible wavelength[s] and RH”. I have only a few minor comments that should be addressed.

The introduction is very complete and gives good motivation for the current study.

How does phase function from this system relate to phase function measured from a polar nephelometer? Could raw data be shown?

Why are the authors using one apparatus for one RH range and another for the higher RH range?

I struggled at times to read this article due to the many, many acronyms. For example, in other papers on optical properties, “BB” means broadband, and here it means Bessel beam, which leads to confusion. Please cut down on their use.

Fig 5: It is unclear why results vary so much from one another and are different than Tang et al. even for measurement at close to the same wavelength. I would expect less dispersion at larger wavelengths, but the differences look comparable in the 600nm region to the data for 405 vs 473 nm even though they are only separated by 13 nm.

Fig 6: Why is a large deviation seen for ammonium bisulfate at low RH between values obtained with CRD and those obtained from the phase function?

How easily expandable are the techniques used in this paper to the study of mixed organic/inorganic mixtures?

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2017-276, 2017.