Atmos. Chem. Phys. Discuss., 8, S1129–S1131, 2008
www.atmos-chem-phys-discuss.net/8/S1129/2008/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Laboratory measurements of the optical properties of sea salt aerosol" *by* R. Irshad et al.

A. Lambert (Editor)

lambert@mls.jpl.nasa.gov

Received and published: 31 March 2008

This paper presents new measurements of the optical properties of sea-salt aerosol in the infra-red region. Disagreements are found with refractive indices calculated by the component volume mixing method.

Please address the following specific points in the revised manuscript:

Please improve the abstract. It is too short and does not give the reader sufficient information about the results given in the paper.

1) Why is the term "relative humidity" (RH) used instead of aerosol solute concentration?

2) Page 80 line 5: Consider changing "As the aerosol becomes wetter" to "as the aerosol solution becomes more dilute".

3) Page 80 line 7: According to Figure 5 the measured refractive index of pure water is 1.4 whilst the text states a value of 1.33.

4) Page 78 line 10: Does this mean that the real and imaginary indices do not display the Kramers-Kronig relationship?

5) Page 81 line 26: "... have since been superceeded". "Calculations ... more recent data..." It is not clear which datasets you are referring to here.

The value of M(infinity) obtained for solid sea salt (2.2) is high compared to values for solid NaCl crystals. See references in the Saint-Gobain Crystals Product Data Sheet for NaCl. http://www.photonic.saint-gobain.com/Media/Documents/S00000000000000001020/NaCl.pdf

The following references may be useful and indicate that component volume mixing rules used to determine refractive indices from aerosol components are adequate at other wavelengths.

Querry, M. R., W. Holland, and R. C. Waring, J. Opt. Soc. Am., Vol. 66, 830–836, 1976. "Complex refractive index in the infrared for NaCl, NaNO3 and NaHCO3 in water"

Tang, I. N. (1997). "Thermodynamic and optical properties of mixed-salt aerosols of atmospheric importance." Journal of Geophysical Research-Atmospheres 102(D2): 1883–1893.

Tang, I. N., A. C. Tridico, et al. (1997). "Thermodynamic and optical properties of sea salt aerosols." Journal of Geophysical Research-Atmospheres 102(D19): 23269–23275.

Winter, B. and P. Chylek (1997). "Contribution of sea salt aerosol to the planetary clear-sky albedo." Tellus Series B-Chemical and Physical Meteorology 49(1): 72–79.

ACPD

8, S1129–S1131, 2008

Interactive Comment

Mahmood Mat Yunus, W., Applied Optics, Volume 31, Issue 16, June 1, 1992, pp.2963-2964. "Temperature dependence of refractive index and absorption of NaCl, MgCl2, and Na2SO4 solutions as major components in natural seawater"

Ruy Batista Neto, José Paulo Rodrigues Furtado de Mendonça, Bernhard Lesche, Revista de Física Aplicada e Instrumentação vol. 17, no. 2, Junho, 2004, 74–79. "Determination of Absolute Values of Refractive Index of Liquids Using an Interferometric Method" available from ... http://www.sbfisica.org.br/rfai/Vol17/Num2/v17_74.pdf

---

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 71, 2008.