Atmos. Chem. Phys. Discuss., 9, C11675–C11677, 2010
www.atmos-chem-phys-discuss.net/9/C11675/2010/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Hygroscopic properties of Amazonian biomass burning and European background HULIS and investigation of their effects on surface tension with two models linking H-TDMA to CCNC data" *by* E. O. Fors et al.

Anonymous Referee #1

Received and published: 22 March 2010

Review of Fors et al

This paper discusses the hygroscopic growth and CCN activity of samples of complex organic matter which the authors term as HULIS. Due to small sample size these HULIS are not characterized, so the only definition is the empirical one. The samples are from rural European site (winter and summer samples) and from biomass burning air masses in Brazil (day and nights samples). The hygroscopic growth and CCN activity were studied using fairly standard techniques and were analyzed by two different approaches which gave slightly different conclusions regarding the possible surface

activity of the samples. The paper concludes that HULIS may lower the surface tension at the point of activation and that there is a large variation in the properties of such compounds. The paper makes a contribution to the literature about these intriguing components of aerosols in the atmosphere. It is clearly written and should be accepted for publication following minor revision.

Minor points: P26928L18: Other studies that mentioned these properties and should be cited include:

Wex, H., Hennig, T., Salma, I., Ocskay, R., Kiselev, A., Henning, S., Massling, A., Wiedensohler, A., and Stratmann, F.: Hygroscopic growth and measured and modeled critical super-saturations of an atmospheric HULIS sample, Geophys. Res. Lett., 34, 2007.

Dinar, E., Taraniuk, I., Graber, E. R., Anttila, T., Mentel, T. F., and Rudich, Y.: Hygroscopic growth of atmospheric and model humic-like substances, J. Geophys. Res., 112, D05211, doi:10.1029/2006JD007442, 2007.

Taraniuk, I., Graber, E. R., Kostinski, A., and Rudich, Y.: Surfactant properties of atmospheric and model humic-like substances (HULIS), Geophys. Res. Lett., 34, L16807, doi:10.1029/2007GL029576, 2007.

P26929 L26 Add Wex et al GRL 2007

P26930L10: Explain how the samples were stored since sampling until the experiments.

P26931: Did the Hungarian and SMOCC sample undergo the exactly same extraction procedure? This is an important point for the ability to compare between them.

P26935L13: How do the models used relate to the approach of WEX et (GRL 2007). What are the differences and advantages? WEX et al have tried to use the models to extract parameters such as MW and amount of dissociation. How do the kappa values that are derived here relate to those found by Wex et al? Is there a way to make

some general conclusions from your experiments on the possible molecular weight and dissociation?

P26927L20: Missing symbol for the surface tension at the end of the line

P26939L1: Missing symbol for the surface tension at the end of the line (after “new”)

P26940L14: why the day samples were more hygroscopic? Is it expected that they will be fresher than the night ones? Can you shed light on this observation?

P26941L20-24: Why some samples undergo restructuring and some do not? Is it an inherent property of the material or a result of the preparation? If it is the latter – what should be the Gf be? Is it for the predetermined dry size or in relation to the smallest size after reconstruction. This points needs discussion and clarification. As such, the reported Gf for some of these samples may not be well-defined and they may actually have a higher Gf than reported here!

P26942L20: Add references to WEX and Taraniuk who also concluded about the lower surface tension

P26946L6: summarize the pros and cons of the two approaches as a lot of attention was given to these two models in the paper.

P26946L25: This statement contradicts what is stated in P26940L14

Table 2: add measurements from Wex et al GRL 2007

Table 3: what do the low r2 value indicate? What is their meaning?

Figure 6: what do the lines mean? Which compounds do they represent? They do not seem to contribute to the figure

---

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 26925, 2009.