

Interactive comment on “Cloud condensation nuclei properties of model and atmospheric HULIS” by E. Dinar et al.

Anonymous Referee #2

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The paper presents studies on the CCN activation of aerosols containing humic and fulvic acids. This is one of the first studies on the activation properties of these kind of compounds. Studied compounds were Suwannee River Fulvic Acid, used as a model compound for atmospheric humic-like substances, and three different types of aerosol samples from urban air. The paper is well written and presents results clearly. There are still some points that need clarifying and reconsideration.

Specific comments and questions:

In Abstract it is said that: 'The lower molecular weight fractions activated at lower critical diameters, which is explained by the greater number of solute species in the droplet

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with decreasing molecular weight.' This sentence is a bit confusing. By default, according to the Köhler-equation, the critical saturation of the aerosol particles decreases with decreasing molecular weight, which will lead to lower critical diameters (see e.g. Fig 6.), so why is this an important result?

Surface tension measurements: The measurements were made for solutions of 1 g/L solutions. It seems that no dependence of surface tension on the organic concentration was determined, although the surface tension can be quite sensitive on the organic concentration. As it has been said in the manuscript (page 1093), the concentration of the organic is probably higher when the droplet is activated. I would expect the concentration to be 10 times (or more) higher than 1 g/L in some cases presented in the paper, maybe 10 times lower in some. Wouldn't it have been possible to make measurements on surface tension for other concentrations and get a rough estimate on the concentration dependence?

When calculated the dry activation diameter in Fig 6b, dissociation constant of 1.25 was used for all SRFA samples, where as in Table 4 the acidity of the different samples changes. Is it possible to do an estimate of the Van't Hoff factor for each sample? It seems that the acidity might explain the trend of measured dry activation diameters.

The studied compounds are assumed to be fully water soluble, with no solid phase in the droplets. Is there any information on the solubility of these compounds in water?

Technical corrections:

Page 1096, line 19. should be 'diafiltration'?

In Table 5, the units are missing.

In Figure 6, the supersaturations are in wrong order.

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