

Interactive comment on “Cloud condensation nuclei activity at Jeju Island, Korea in spring 2005” by M. Kuwata et al.

Anonymous Referee #2

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This paper presents data and analysis of CCN activity of field measurements during the March–April 2005 campaign at Jeju-Island, Korea. Measured results are compared to theoretical calculations which include a range of assumptions based on experimental data and extreme case assumptions. The paper includes an excellent overview and detailed descriptions of most of the experiments and conditions. The authors make a good case to support their conclusions that differences between D_{50} and D_{crit} are due to unknown size-dependent chemical compositions and/or unknown (but parameterized) surface tension lowering effects. The field location used for this study is a new and important one which adds to the literature database of CCN field studies around the world. This paper will be of interest to readers of Atmospheric Chemistry and Physics. It is well-written and requires no major revisions for publication. Some

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specific comments by page and line number are given below:

P15806 L9: Inclusion of standard deviation with the averages would be useful here.

P15806 L20: A line commenting on how this study compares to similar CCN studies elsewhere in the world might be useful for reference and to put this work in perspective.

P15807 L25-29: This information seems better suited for the abstract?

P15808 L22: Kelvin effect is due to particle size which is a much more important component of the first term than is surface tension. This sentence implies that the Kelvin effect is a surface tension effect which it is not.

P15809 L15: Was RH <5% measured or estimated? Was it steady over the experiments even as the silica gel (was it silica gel?) became saturated with water vapor? From the reviewers experience, flowrate would need to be very low and silica gel constantly regenerated for two TSI 3062s to get RH <5%. This issue of metastable solution droplets vs. dry particles could have a large effect on CCN activity and other calculations such as particle mass and density. Perhaps the authors could include some commentary regarding this point.

P15812 L21-22: The comment that "The slower increase rate indicates the co-existence of different types of aerosol particles" is not necessarily true. Even laboratory studies of single-component inorganic and organic compounds show this rate change. While composition may be part of it, simple DMA size-distribution broadening is the primary reason for this phenomenon.

P15813 L18: How do these counts compare to other CCN studies?

P15816 L5-7: The fact that experimental activations are similar to ammonium sulfate does not, by itself, indicate the particles were ammonium sulfate. It merely suggests that they behave similar to ammonium sulfate. Many large and complex mixtures of organics and inorganics existing in metastable liquid states could behave similar to ammonium sulfate even when containing no ammonium sulfate.

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P15822 L3: Define "nss"; before using it for the first time.

P15826 L2-3: Again, it suggests they behave as ammonium sulfate but not necessarily that they ARE ammonium sulfate.

Figure 3: The caption indicates standard deviation is shown when it is not.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 15805, 2007.

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