

Interactive comment on “Measurements of cloud condensation nuclei activity and droplet activation kinetics of wet processed regional dust samples and minerals” by P. Kumar et al.

P. Kumar et al.

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Response to Referee #2

We thank the referee for the thoughtful review. Our responses to the issues raised follow.

Reviewer: Page 12562, Lines 8-9: The generation method should be noted here. Also, please clarify that these are soil samples that were atomized, rather than resuspended dust collected on a filter, for example

Author: Done.

C7017

Reviewer: Section 2.2: It should be mentioned that an SMPS was utilized for the size distribution measurements, as shown in Fig. 1.

Author: Done

Reviewer: Section 4: For interpretation of the soil sample data, it would be useful to state the most prevalent minerals in the soils (should be available in the literature); this should allow for comparisons between the minerals and soils and greater interpretation of the CCN properties.

Author: This is a good point. Regional dust soils are a mixture of different minerals in various proportions that vary considerably even at the same region. A direct comparison is thus difficult, so we consider a qualitative assessment instead.

Reviewer: Section 5: Addition of a glossary table is suggested to clearly define (in one place) all of the terms utilized in the equations, as searching for the term definitions can become cumbersome.

Author: Excellent point. A table is now included.

Reviewer: Page 12585, Last Paragraph: It is not clear how equation 15 was applied to result in the data points shown in Fig. 9. These are exciting results that show how this new framework can be applied to other samples; therefore, please clarify this process. How were different chemistry solutes considered?

Author: The exponents x_{exp} were determined following the procedure of Kumar et al. (2009b); s_c is determined by numerically finding the maximum of equation 15 for a range of dry diameters. The resulting dry diameter-supersaturation pairs are fit to a power law, from which x_{exp} is determined. The fraction of solute and its composition for each sample were obtained from available literature (Reheis, 1997, Kandler et al., 2009).

Reviewer: Page 12575, Line 26: Fix typo.

C7018

Author: Corrected.

Reviewer: Page 12577, Lines 1-2: Fix grammar.

Author: Corrected.

Reviewer: Page 12581, Lines 11-12: "dry dust lake beds" should be "dry lakebeds".

Author: Corrected.

Reviewer: Page 12581, Line 27: "or the Kelvin" should be "or Kelvin".

Author: Corrected.

Reviewer: Page 12586, Lines 18-20: Rearrange sentence for clarity.

Author: Corrected.

Reviewer: Page 12591, Lines 27-30: Sullivan et al. has since been published in final form in ACP; please fix

Author: Corrected.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 12561, 2011.