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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Effect of chemical mixing state on the hygroscopicity and cloud nucleation properties of calcium mineral dust particles" *by* R. C. Sullivan et al.

Anonymous Referee #1

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General questions to the abstract and introduction:

-Mineral dust aerosols are especially important for mixed and ice clouds where they act as ice nuclei (IN) hence these processes should be somewhere mentioned. In addition, is it possible to estimate how important mineral dust aerosol effects are in terms of CCNs versus INs?

- About dusts and CCNs - there is a recent study by Lee et al., 2008, ACPD, saying these aerosols can also suppress CCN concentrations which should be mentioned. Could this also be the case for the Ca-dusts?

- How important are Ca-dusts on a global scale? Are there other sources except Asia?

Experimental methods:

P5, ll.14-18: Statement how the size distributions of dry and wet generated aerosols looked like would be interesting.

P7, ll. 2-4: I assume dry dust particles to be rather large, hence doubly charged particles might account for most particles at the lower end of the size distribution. Thus, scans of the critical activation diameter might be only suitable to a limited extend? E.g. for Fig.5, is it possible to data mark points with different symbols according to there scanning technique? Is there a difference between the scans of supersaturation versus scans of the critical activation diameter?

Fig. 5: To interpret the data points it would be also useful to have a note which dust was produced wet/dry.

Atmospheric Implications:

- Is it possible to draw any consequences between the water uptake and INs, e.g. in terms of the freezing mechanism?

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Interactive Comment