



Are the cloud condensation nuclei (CCN) properties in polluted air different from those in a remote region?

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CCN properties of remote and polluted continental aerosol were measured on Mt. Jungfrau (3570m asl), Switzerland and in a rural region northwest of the megacity Guangzhou in south China, respectively. At both sites, CCN concentrations and efficiencies were measured as a function of particle diameter and water vapor supersaturation.

The two measurement sites are characterized by aerosols of different sources and state of ageing. Nevertheless, the average CCN efficiency spectra (CCN/CN vs. particle size) are very similar for supersaturations of 0.5% and higher, which are required to efficiently activate particles with diameters ≤ 80 nm. At small supersaturations (0.1-0.3%), however, the CCN efficiencies in polluted air are on average significantly lower than under remote conditions.

Since low supersaturations are most typical for the atmosphere, the observed differences should be considered in the modeling of CCN activation and cloud formation. They may have a strong influence on aerosol-cloud interactions and on the effects of air pollution on climate.

References:

Dusek, U., Frank, G. P., Hildebrandt, L., Curtius, J., Schneider, J., Walter, S., Chand, D., Drewnick, F., Hings, S., Jung, D., Borrmann, S., and Andreae, M. O.: Size matters more than chemistry for cloud-nucleating ability of aerosol particles, *Science*, 312, 1375-1378, 2006.

Frank, G. P., Dusek, U., and Andreae, M. O.: Technical note: A method for measuring size-resolved CCN in the atmosphere, *ACPD*, 6, 4879-4895, 2006.

Rose, D., Frank, G. P., Dusek, U., Andreae, M. O., and Pöschl, U.: Calibration and measurement uncertainties of a continuous-flow cloud condensation nuclei counter (DMT-CCNC), to be submitted to ACPD.