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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Closure between measured and modeled cloud condensation nuclei (CCN) using size-resolved aerosol compositions in downtown Toronto" *by* K. Broekhuizen et al.

Anonymous Referee #2

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This manuscript is presents a well-defined and complete study and is exceptionally clear in its presentation. It is certainly worthy of publication in Atmospheric Chemistry and Physics. The distinct advantage of more highly size-resolved compositional information in attaining aerosol/CCN closure is an important result (if anything, it could be emphasized more). The work is acceptable for publication in its current state; the suggestions that follow are only thoughts and curiosities that arose during my reading.

On pages 8 and 9, the authors note that early in the study, a comparison between the mass concentrations derived from the AMS, a TEOM, and from integrated size

distributions indicated that the AMS collection efficiency was ˜50%. How did the AMS compare with the TEOM and size distributions over the rest of the study? It's a bit unclear whether the 50% number is for the early haze event or for the whole study.

On page 9, the authors note the 40% correction that is applied to all CCN data from the thermal gradient diffusion chamber. This correction is well-established for their instrument; I'm curious whether the authors have made any progress toward ascertaining the cause for the undercounting. Even though the counting bias has been characterized in some detail in previous studies, its continued presence is a mild cause of concern.

On page 10, in describing the m/z markers for processed and primary organic particles, the authors indicate that oxidatively processed aerosol are equivalent to secondary organic aerosols. As the authors are surely aware, this assumed equivalency has been a source of controversy of late. Since this controversy remains unresolved and is unrelated to the presented work, it may be best to remove the reference to OOC as secondary organic aerosol.

Again, the authors are to be complimented on a clear, readable manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 6263, 2005.