

Interactive comment on “A model for particle formation and growth in the atmosphere with molecular resolution in size” by K. E. J. Lehtinen and M. Kulmala

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1. As is pointed out by the referee, the extension to molecular sizes is not unique. The mentioned paper Oh and Sorensen (1997), however, just repeats the well-known coagulation kernels that are also available in well-known books by Seinfeld and Pandis, Flagan or Friedlander. The motivation of the $\checkmark$ correction is that typically, when talking about condensation, people seem to use the Fuchs-Sutugin formalism, which does not take into account molecular dimensions of the vapour or particle mobility. Naturally, our modification of this formalism approaches coagulation theory in the free-molecular limit. However, to clarify our approach, this clarification was added to the manuscript.

2. As correctly noted by the referee, the evaporation terms are neglected in our model, which is now more clearly stated in the revised manuscript. The references provided

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by the referee related to this matter are acknowledged and added to the manuscript.

3. The nucleation rate of the simulation was chosen to be identical with the simulation by Kulmala et al. (2000), which means that it was a result of ternary water H_2O sulfuric acid H_2SO_4 ammonia nucleation. The background particle concentration was selected to be the measured concentration before the event at 7:00 a.m. This clarification was also added to the corresponding section of the revised manuscript.

4. A constant value was indeed chosen for the vapour concentration, and this choice seems to reproduce the experimental observations reasonably well. This is because the observed diameter growth rate seems to be linear in the observed events H_2O the linear growth corresponds to constant condensable vapour concentration.

The three minor technical corrections suggested by the referee were done.

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 1791, 2002.

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