

## ***Interactive comment on “Modelling the formation of organic particles in the atmosphere” by T. Anttila et al.***

**T. Anttila et al.**

Received and published: 2 March 2004

Because referee did insist some changes, which we consider as reasonable, to the manuscript, we explain the major changes made in the following.

Response to general comments:

The terminology related to "nano-Köhler theory"(described in Section 2.1) is now revised. For example, we do not refer to "a recently-developed theory" or to "nano-Köhler theory" but use phrases such as "an application of a theory describing activation of..." (last paragraph of Introduction), "applied framework" or "approach" (both in Section 2.1). We also mention explicitly that our approach is based on the traditional Köhler theory (first paragraph of Section 2.1).

Response to specific comments:

[Full Screen / Esc](#)

[Print Version](#)

[Interactive Discussion](#)

[Discussion Paper](#)

1. A term "saturation vapour concentration as a pure compound" is now used.
2. This inconsistency was removed by correcting the notation in Equation (1).
3. A single governing equation describing how condensation, coagulation and nucleation are included in the model cannot be written due to the model structure. Also, inclusion of too many equations would only make the paper lengthy. Therefore, in order to make the model description more comprehensible, we have made the following modifications to Section 3. First, the treatment of the aerosol size distribution is now presented before the description of aerosol processes. Second, the description of aerosol processes (section 3.3) is now more detailed, especially what comes to coagulation.
4. The quantification of this statement does not actually require any additional model runs but it can be explained by the following reasoning which is now presented in the second paragraph of section 5. As discussed in section 4.3, non-activated clusters grow mainly by condensation of sulphuric acid unless the nucleation rate is very high. The resulting growth rate is therefore directly proportional to the gas-phase concentration of sulphuric acid which was estimated to be three times higher in spring than in summer.

Response to technical corrections:

1. The English usage was refined throughout the paper. For example, the second sentence of section 2.1 was rewritten.
2. Periods are now used in Fig 1.
3. This comment has been accounted for. For example, the saturation vapour concentration as a pure compound is now denoted by  $C_0$  using a superscript.
4. All symbols are now defined, including  $v_i$  (first paragraph of section 2.1).

---

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 6147, 2003.