

## ***Interactive comment on “Comment on evidence for surface-initiated homogenous nucleation” by J. E. Kay et al.***

**J. E. Kay et al.**

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We thank AR #2 for reading our comment and providing her/his constructive review. Below we respond to the two specific issues raised by AR #2.

### **1) Nucleation rate expression**

Conceptually, we describe the nucleation rate as the product of an attack frequency and a transition probability. We use this simplified form of the nucleation rate expression to illustrate differences between 2D surface nucleation, 3D surface nucleation, and volume nucleation.

### **2) Large free energy difference for the surface**

At the end of section 2.1, we state that we are unaware of evidence for a large free energy difference between the energy required to form an embryo at the surface and in the volume. The reviewer was concerned about chemical composition differences

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between the surface and the volume of the droplet. In this discussion, we are referring to differences in chemical potential, independent of chemical composition. We acknowledge that chemical composition may be important, but we have not addressed this issue in this comment.

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Interactive comment on Atmos. Chem. Phys. Discuss., 3, 3361, 2003.

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