

Interactive
Comment

Interactive comment on “Homogeneous vs. heterogeneous nucleation in water-dicarboxylic acid systems” by A. I. Hienola et al.

Anonymous Referee #2

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GENERAL COMMENTS

The paper presents a theoretical study concerning homogeneous versus heterogeneous nucleation in water-dicarboxylic acid systems. a field of ongoing research efforts, and important to atmospheric science. Consequently, the scientific question(s) addressed in the manuscript are well within the scope of ACP.

The paper contains significant original material and the principle results of the paper are presented in the abstract. The methodologies are sound and assumptions are clearly stated, the data are sufficient and of high enough quality to support the interpretations and conclusions.

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The paper is very well structured and clearly written. Scientific results are sound and convincing. No parts of the paper are unnecessary. Letters in figures are generally too small.

The manuscript represents a significant contribution to the field of atmospheric science and should be accepted for publication in ACP after some minor revisions.

SPECIFIC COMMENTS (some of those can certainly be considered a matter of taste)

page 18296, line 11: ... in gas with three orders ... => ... in the gas by three orders ...

page 18296, line 16: ... might be possible in conditions ... => ... might be possible under conditions ...

page 18296, line 22: ... set of processes that include ... => ... set of processes that includes ...

page 18297, line 4: A little explanation what s meant by ...(when the nucleation probability is homogeneous through the system) ... would be useful.

page 18297, line 16: ... be important in atmospheric conditions ... => ... be important under atmospheric conditions ...

page 18297, line 21: Unfortunately the atmospheric observation on ... => Unfortunately atmospheric observations on ...

page 18298, lines 5: In the recent years ... => In recent years ...

page 18298, lines 13 - 16: The last sentence in this paragraph is somehow screwed up and needs revision

page 18298, lines 20: ..., we will focus on first steps ... => ..., we will focus on the first steps ...

page 18300, lines 4: ... reducing the binary system to unary system, ... => … reducing the binary system to a unary system, ...

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page 18302, lines 1: ... of CO₂ in Martian conditions, the use of exact formulation ...
=> ... of CO₂ under Martian conditions, use of exact the formulation ...

page 18302, lines 2: ... rates that the ... => ... rates than the ...

page 18302, eq. 14: variable R has not be introduced.

page 18302, line 20: A input for what were the activities used ? Just a short explanation would be useful.

page 18306, line 2: Their results suggest that the process => Their results suggest as the process ...

page 18306, line 18: ... varied one at the time ... => ... varied one at a time ...

page 18306, line 22: ... data for these four specific systems, our ... => ... data for the four specific systems investigated here, our ...

page 18307, line 2: ... for the heterogeneous ... => ... for heterogeneous ...

page 18307, line 4 - 6: I don't understand the reasoning here ! Some revision is suggested.

page 18307, line 7: We remark the ... => We note ...

page 18307, line 8: ... the slopes are steeper with ... => ... the slopes become steeper with ...

page 18307, line 24: ... nucleation with another order ... => ... nucleation by another order ...

page 18307, line 27: ..., about 2 orders ... => ..., i.e., about 2 orders ...

page 18308, line 5: ... takes place at the same concentration in ... => ... takes place for similar concentrations in ...

page 18308, line 10: ... we present the nucleation ... => ... we present nucleation ...

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page 18308, line 12: ... weak at the studied range and it becomes ... => ... weak in the studied range and becomes ...

page 18308, line 17: ... in gas phase ... => ... in the gas phase ...

page 18308, line 20: ... closely by the adipic acid. => ... closely by adipic acid.

page 18309, line 1: ... nucleation with about ... => ... nucleation by about ...

page 18309, line 7: A resembling behavior ... => A similar behavior ...

page 18309, line 13: ... than homogeneous one for ... => ... than homogeneous nucleation for ...

page 18309, line 15: ... are bigger ... => ... are larger ...

page 18309, line 16: ... gas phase concentrations ... => ... gas phase concentrations required for ... ??? It's not clear what the authors are trying to say here !

page 18309, line 19: ... homogenous one is also ... => ... homogeneous nucleation has also been ...

page 18309, line 23: ..., like in upper troposphere and the lower stratosphere ... => ..., like in the upper troposphere and the lower stratosphere ...

page 18309, line 27: ... probable that investigated ... => ... probable that the investigated ... The statement made in this sentence seems to be somewhat disconnected and vague.

page 18310, line 1: Several recent studies indicates ... => Several recent studies indicate ... This sentence, including the references, is not needed here.

page 18310, line 6: ... included only roughly ... => ... parametrized ...

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 18295, 2008.

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