

Interactive comment on “Chlorine activation on stratospheric aerosols: uncertainties in parameterizations and surface area” by T. Wegner et al.

Anonymous Referee #2

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General comments

The manuscript evaluates the influence of different aerosols on the chlorine activation using aircraft and satellite observations as well as the modeling results. The subject is for sure relevant to the ACP scope. The manuscript is well written and organized. The authors made several interesting conclusions. In particular, they demonstrated that the chlorine activation occurs mostly on the background aerosol and the role of STS&NAT particles is not important over the Arctic. They also conclude that the uncertainty in the parameterizations of the heterogeneous reaction rates on background aerosol is rather small. This conclusion is important for ozone community. I think that the paper should

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be published in ACP after some minor revisions specified below.

Specific comments

1. I think the title is not completely in agreement with the results. I would suggest something like: “Chlorine activation in the Arctic stratosphere: the role of different aerosols”
2. I suggest some discussion on the role of N_2O_5 hydrolysis. I think this reaction could also play a role in chlorine activation.

Minor comments and technical corrections

1. Page 20563, Line 3: “... in late in winter ...” should be “... in late winter ...”
2. Page 20565, Lines 18-19: There are other sources of NO_x . Depending on the altitude the influx from the thermosphere, electron precipitation or galactic cosmic rays could contribute.
3. I would change “every Kelvin cooling” to “every 1 K cooling”, otherwise it reads like a process “Kelvin cooling”
4. Page 20574, line 8: Does formation of NAT necessarily means irreversible denitrification?
5. Page 20580: If the authors refer to CCMVal-2 report than the correct reference is: SPARC Report on the Evaluation of Chemistry-Climate Models, edited by: Eyring, V. Shepherd, T. G., and Waugh, D. W., SPARC Report No. 5, WCRP-132, WMO/TD-No. 1526, 2010.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 20561, 2012.

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