

Interactive comment on “Halogens and their role in polar boundary-layer ozone depletion” by W. R. Simpson et al.

Anonymous Referee #2

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General comments:

This manuscript presents an extensive review of the current knowledge of halogens and their role in polar atmospheric chemistry, especially in the ozone depletion events (ODEs). This review supplies very wide and useful information in many related aspects and will help us for further understanding of this hot issue which started 20 years ago. Certainly, some conclusions have large uncertainties and may cause further debate, for example the roles of frost flowers in the occurring of ODEs. It should be published after some minor modifications.

Specific comments:

Page 4290 line 8: please add latitude and longitude for Ny-Alesund, like for Barrow and

Alert.

Page 4291 line 4-5: this sentence let reader get confused. You mentioned that the mechanism of bromine release from sea salt is not clear now. But here you say that the main source during bromine explosion is via photochemical reactions. I do not think you want to rule out the heterogeneous reaction factor, but it would be better to make it clear.

Page 4292 line 14: the reference here for Antarctic and Arctic observation should be Tarasick and Bottenheim 2002, but not Tarasick et al., 2005.

Page 4292 lines 2, 19 and 21: using Tarasick and Bottenheim 2002, but not Tarasick et al., 2002.

Page 4292 and section 2.1.3: in discussion of temperature effects on bromine activity. Although high BrO is observed over salt lakes where its temperature is above zero degree, this does not mean cold temperature is not necessary in the polar bromine activities. Temperature may be not important in the reactivation of inorganic bromine species on aerosols, but it is important in bromine supply in polar. The significant difference in bromine chemistry between polar sea ice and salt lakes is over salt lakes there are high levels of salty particles while in polar region the supply of salt in brine expelled from new sea ice formation is certainly temperature-related. The cold temperature will cause more saline amount onto the sea ice surface and eventually causing relatively high saline in snowpack for activation. Additionally, the formation of frost flowers is also highly temperature dependent. So, do not mis-lead reader when you say temperature is not a pre-requisite factor in bromine activity.

Page 4300 line 2: remove the unnecessary dot after Br₂.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 4285, 2007.

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Interactive Discussion

Discussion Paper