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## Carbonate precipitation in brine – a potential trigger for tropospheric ozone depletion events

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**Abstract.** Tropospheric ozone depletion events (ODEs) at high latitudes were discovered 20 years ago and are attributed to bromine explosions. However, an unresolved issue is the explanation of how the acid-catalyzed reaction cycle is triggered in atmospheric particles derived from alkaline sea water. By simulating the chemistry occurring in polar regions over recently formed sea ice, we can model successfully the transformation of inert sea-salt bromide to reactive bromine monoxide (BrO) and the subsequent ODE when precipitation of calcium carbonate from freezing sea water is taken into account. In addition, we found the temperature dependence of the equilibrium  $\text{BrCl} + \text{Br}^- \leftrightarrow \text{Br}_2\text{Cl}^-$  to be important.

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