

Atmospheric sea-salt and halogen chemistry in the Antarctic region

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Sea-salt aerosols (SSA) are one of major aerosols in troposphere. SSA is released from ocean surface in the Southern Ocean via burbble bursting under strong wind conditions. In addition to SSA emission from open-sea surface, SSA can be released from seasonal sea-ice surface in the Antarctic coast during winter – spring. Because sea-salt fractionation occurs on/in sea-ice and frost flowers during sea-ice formation, SSA originated from sea-ice has different ratios (e.g., halogen enrichment) from bulk seawater ratio. Heterogeneous reactions on the fractionated SSA, blowing snow, and snowpack on sea-ice (including frost flowers) can act as important potential-origins for atmospheric reactive halogens, which relate closely to atmospheric chemistry such as O₃ chemistry. Additionally, occurrence of sea-salt fractionation is expected on snow surface on the Antarctic continent during summer. Here, we present atmospheric cycles of SSA and halogens in the Antarctic on basis of our previous field measurements in the Antarctica and Arctic.

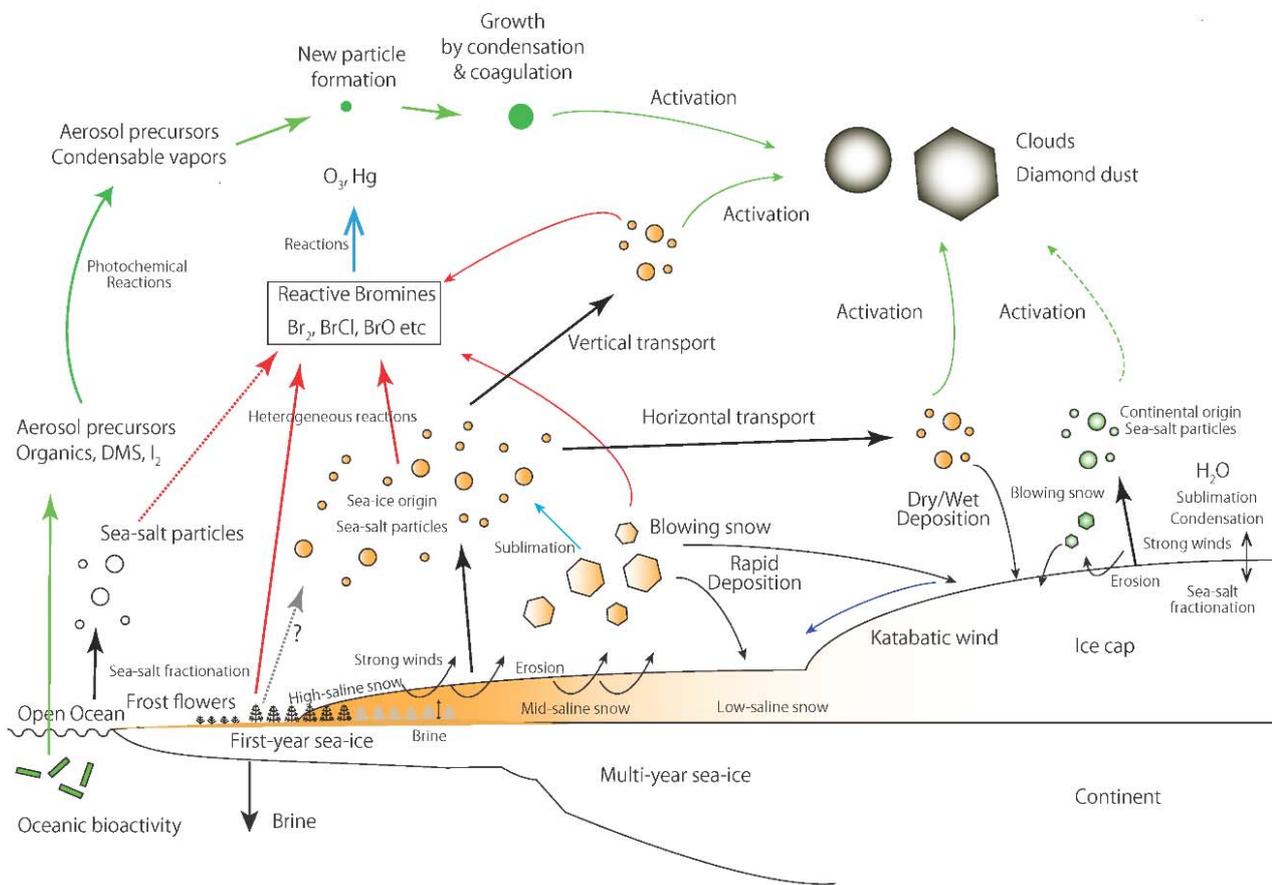


Fig.1 Schematics of atmospheric sea-salt and halogen cycles in polar regions. Dotted arrows indicate the speculated processes.