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# Pernitric acid in a coastal Antarctic boundary layer

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Pernitric acid ($HO_2NO_2$) has been mooted to play an important role in low altitude photochemistry of the polar regions. This potential arises from the intrinsic link between PNA and atmospheric $NO_x$ and $HO_x$ radicals. For example, gas-phase production and destruction reactions are, respectively, sinks and sources of $NO_x$ and $HO_x$. Further, PNA can strongly adsorb to ice/snow surfaces, so has the potential to form reservoirs of radicals within the condensed phase, either temporary or longer-term. Previous measurements at the South Pole detected significant amounts of boundary layer PNA with a lifetime controlled predominantly by dry deposition and thermal decomposition. No observations at warmer, coastal, Antarctic sites have yet been reported.

As part of a year-round field campaign at the British Antarctic Survey station, Halley, in coastal Antarctica, measurements of PNA were made using a Chemical Ionisation Mass Spectrometer (CIMS). Observations extended from March (austral autumn) through to September (austral spring) with further periods in late spring and summer. The CIMS concurrently measured nitric acid, and measurements of NO and $NO_2$ were obtained by a chemiluminescence analyser.

Here we report the PNA observations made at Halley and compare them with the measurements made at South Pole. We discuss the data within the context of additional supporting chemical and meteorological observations and consider the influence of PNA on atmospheric radicals both through gas phase reactions and via exchange between the air and the snowpack.