# Preliminary observation report on chlorofluorocarbons (CFCs) and sulfur hexafluoride ($SF_6$) off the Cape Darnley in the summer of 2019

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Antarctic Bottom Water (AABW) occupies the largest volume of water mass in the global ocean and its formation is a key process of global ocean circulation. Ohshima et al. (2013) found newly formed AABW off the Cape Darnley (Cape Darnley Bottom Water; CDBW). However, little is known about the circulation of CDBW and its time scale. To quantitatively understand the spread and circulation of CDBW, it is effective to use the chemical tracer such as chlorofluorocarbons (CFCs) and sulfur hexafluoride ($SF_6$). We carried out CTD observation and water sampling off the Cape Darnley in the summer of 2019. Water sampling was performed from ocean surface to the bottom at 16 Stations (along the Wild Canyon and its west). CFCs and $SF_6$ of the samples were measured by an analytical system developed at JAMSTEC based on Bullister and Wisegarver (2008). The concentrations of CFCs and $SF_6$ were significantly high near the surface (< 100 m) (CFC11 > 2.0 pmol $kg^{-1}$; CFC12 > 1.2 pmol $kg^{-1}$; $SF_6$ > 1.4 fmol $kg^{-1}$). They showed a minimum at depths of 800–1500 m and then increased to the bottom. The relatively high concentrations of CFCs and $SF_6$ near the bottom, together with the low temperature (< −0.4°C), reflects the spread of CDBW. At the presentation, we will discuss mean age and circulation of CDBW.

Keywords: Antarctic Bottom Water , Cape Darnley, Chemical tracer

 