Distributions of chemical properties in the western Bering Sea and the western North Pacific during 2004 summer cruise

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Time-series observations at fixed stations and repeat surveys along section are important in understanding temporal variations of chemical properties in the ocean, related with climate change and/or global warming. It is found that dissolved inorganic carbon has been increasing at Stations KNOT (44N, 155E) and K2 (47N, 160E) in the western subarctic gyre from 1992. Biogeochemical transport in the adjacent seas and the coastal areas off the Kamchatka peninsula would affect those variations. During R/V MIRAI, MR04-04 cruise, we obtained the distributions of chemical properties (dissolved oxygen, nutrients, CFCs and others) along the Kuril Islands, the Kamchatka Strait and the Bering Sea to characterize chemical properties in the region related with the time-series stations (KNOT and K2) in the western subarctic gyre. These distributions indicated some results during this cruise.

1. Dissolved silicate in the deep water (27.75-27.78 sigma-theta) is increasing from the western North Pacific subarctic region to the Bering Sea through the Kamchatka Strait. The bottom water in the western Bering Sea (Kamchatka basin) has no CFC-12, but CFC-12 is detectable in the central Bering Sea (Aluetian basin). These results indicate that the deep water in the western North Pacific passes the western Bering Sea through the Kamchatka Strait and spread in the bottom of the Bering Sea.
2. Silicate content of upper deep water (near 27.7 sigma-theta) in the Kamchatka Strait and Kamchatka basin is over 200 umol/kg and higher than those in the western North Pacific.
3. The intermediate water was classified under three water masses (outflow waters from the Bering Sea and the Okhotsk Sea, and the Alaskan Current water along the Aleutian islands) by using the dissolved oxygen and CFCs saturations.