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# Application of ramped pyrolysis $^{14}C$ method to postglacial sediment in the Chukchi-Alaskan margin, western Arctic Ocean.

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The Arctic Ocean underwent dramatic climate changes in the past. Changes in sea-ice extent and ocean currents in the Arctic Ocean cause changes in surface albedo and deep water formation, which drove global climatic changes. However, Arctic paleoceanographic studies have been limited compared to the other oceans due to chronostratigraphic difficulties. One of the reasons for this is absence of material suitable for $^{14}C$ dating in the Arctic Ocean sediments deposited since the last glacial maximum. To enable improved age constraints for sediments impoverished in datable material, we apply ramped pyrolysis $^{14}C$ method (Rosenheim et al., 2008) to sedimentary records from the Chukchi-Alaska margin recovering Holocene to late-glacial deposits. Samples were divided into five fraction products by gradual heating sedimentary organic carbon from ambient room temperature to 900°C. The thermographs show a trimodal pattern of organic matter decomposition over temperature, and we consider that $CO_2$ generated at the lowest temperature range was derived from autochthonous organic carbon contemporaneous with sediment deposition, similar to studies in the Antarctic margin and elsewhere. For verification of results, some of the samples treated for ramped pyrolysis $^{14}C$ were taken from intervals dated earlier by AMS $^{14}C$ using bivalve shells. The ages of lowest temperature split showed older ages than the radiocarbon ages derived from bivalve shells indicating that those splits were still mixtures and not pure autochthonous organic matter. The relationship between radiocarbon ages of generated gas and pyrolysis temperature is linear. We used this empirical relationship to determine the optimal temperature yielding pure marine organic carbon and estimated age of horizons by sampling at those temperatures. We compare these ages to mixing model ages decoupling the simpler mixtures represented by our original low-temperature splits, which were consistent with the bivalve ages.