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**TITLE:** Discovery of authigenic carbonates in the Canada Basin (Arctic Ocean) and its implications

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**ABSTRACT BODY:** Carbonate minerals were discovered from the giant box core (PS72/410-1) of the pelagic sediments recovered from the Canadian Arctic across the central Mendeleev Ridge (Station location= Lat. 80° 30.37'N, Long. 175°44.38'W) during the Arctic cruise by Polarstern in 2008. The core was 39 cm in depth and was collected from the water depth of 1802 meters. The sediments show various colors from grey to brown as previously reported in other Arctic pelagic sediments. The sediments include planktonic foraminifers together with carbonate minerals. The contents of planktonic foraminifers and carbonate minerals vary with core depth, however these carbonate minerals are present through the whole sequence except for a few centimeters.

After wet sieving, coarse fractions were texturally examined with binocular microscope and SEM, and stable isotope compositions were obtained. Mineralogy of carbonate minerals were determined using crystal shapes and qualitative Sr contents by EDAX. The carbonates are composed of calcite, aragonite or a combination of both. Aragonite crystals show radiating fibrous texture, randomly oriented fibrous texture, spherulitic fibrous texture and bladed texture, and calcite crystals show foliated texture, spirally stacked foliated texture, randomly bladed texture, spherulitic fibrous texture, equant texture, and spherulitic equant texture. Various shapes of aragonite and calcite crystals are randomly distributed throughout the core. Highly enriched carbon isotope compositions ( $\delta^{13}C = 0 \sim +5\%$  vs. PDB) strongly indicate that they formed in methanogenic zone below sediment/water interface by the reaction between anoxic pore fluids and host sediments induced by methanogenic bacteria. However, a wide range of oxygen isotope values ( $\delta^{18}O = -5 \sim +5\%$  vs. PDB) still need more scrutiny. Various shapes of carbonate crystals together with highly positive carbon isotope values indicate that these carbonates are authigenic in origin. Because the host sediments including these carbonates are not organic-rich, the presence of the authigenic carbonates may be related to paleoceanographic conditions of the Arctic Ocean which resulted in anoxic pore water conditions just a few centimeters below the sediment/water interface.