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Multiple sulfur isotopic composition of the dissolved sulfate from Svalbard, Arctic

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The fresh water samples were collected in the vicinity of the DASAN scientific station located at the Ny-Alesund, Svalbard, Arctic region. The multiple sulfur isotopic composition (32S, 33S, 34S and 34S) of the dissolved sulfate was measured to trace the origin and deposition processes of sulfur in the Arctic region. The Spitsbergen Island is composed of various formations from Precambrian to Tertiary Period and the Ny-Alesund region consists of Carboniferous to Permian sedimentary rocks. The measured δ34Ssulfate values range widely from -5.8 ‰ to 12.8 ‰ indicating that the sulfur seems to be originated from the various sources. The Δ33Ssulfate and Δ36Ssulfate values ranges from -0.01 ‰ to 0.07 ‰ and from -0.86 ‰ to -0.06 ‰ respectively. These homogeneous and near zero Δ33Ssulfate and Δ36Ssulfate values show the non-anomalous composition of the dissolved sulfate and suggest that the sulfate is completely affected by mass-dependent fractionation process.