

## Challenges in quantifying triple oxygen isotopic compositions of nitrate in subtropical surface oceans

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In this study, we challenged to quantify triple oxygen isotopic composition ( $^{17}\text{O}$ -excess) of nitrate in nutrient-poor subtropical surface seawater.  $^{17}\text{O}$ -excess of low level nitrate in the water sample has been determined by adding nitrate standard of already-known oxygen isotopic compositions in each sample. By using this internal standard method, we successfully determined the  $^{17}\text{O}$ -excess of dissolved nitrate in surface seawater with its concentration ranging from 0.1 to 0.5  $\mu\text{mol/L}$  and observed high  $^{17}\text{O}$ -excess of  $+4.7\pm 2\text{‰}$  in dissolved nitrate of surface seawater samples collected in the western north pacific. The result indicates that atmospheric nitrate deposited on the surface seawater account for 10%~25% of the total dissolved nitrate in the samples.

Keywords: nitrate, triple oxygen isotopic compositions, surface seawater, subtropical ocean