



## Determination of the (15n14n) and (18o16o) Nitrate in Solids: Rsil Lab Code 2897

By -

Bibliogov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 38 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. Summary of Procedure The purpose of Reston Stable Isotope Laboratory (RSIL) lab code 2897 is to determine the (15N14N), abbreviated as 15N, and (18O16O), abbreviated as (18O, of nitrate (NO<sub>3</sub>-) in solids. The NO<sub>3</sub>- fraction of the nitrogen species is dissolved by water (called leaching) and can be analyzed by the bacterial method covered in RSIL lab code 2900. After leaching, the 15N and 18O of dissolved NO<sub>3</sub>- is analyzed by conversion of NO<sub>3</sub>- to nitrous oxide (N<sub>2</sub>O), which serves as the analyte for mass spectrometry. A culture of denitrifying bacteria is used in the enzymatic conversion of NO<sub>3</sub>- to N<sub>2</sub>O, which follows the pathway shown in equation 1. Because the bacteria *Pseudomonas aureofaciens* lacks N<sub>2</sub>O reductive activity, the reaction stops at N<sub>2</sub>O, unlike the typical denitrification reaction, which goes to N<sub>2</sub>. After several hours, the conversion is complete, and the N<sub>2</sub>O is extracted from the vial, separated from water vapor by Nafion drier and from CO<sub>2</sub> with a layered Mg(ClO<sub>4</sub>)<sub>2</sub>Ascarite trap, and trapped in a small-volume trap immersed in liquid nitrogen. After the N<sub>2</sub>O is released, it is further purified...



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