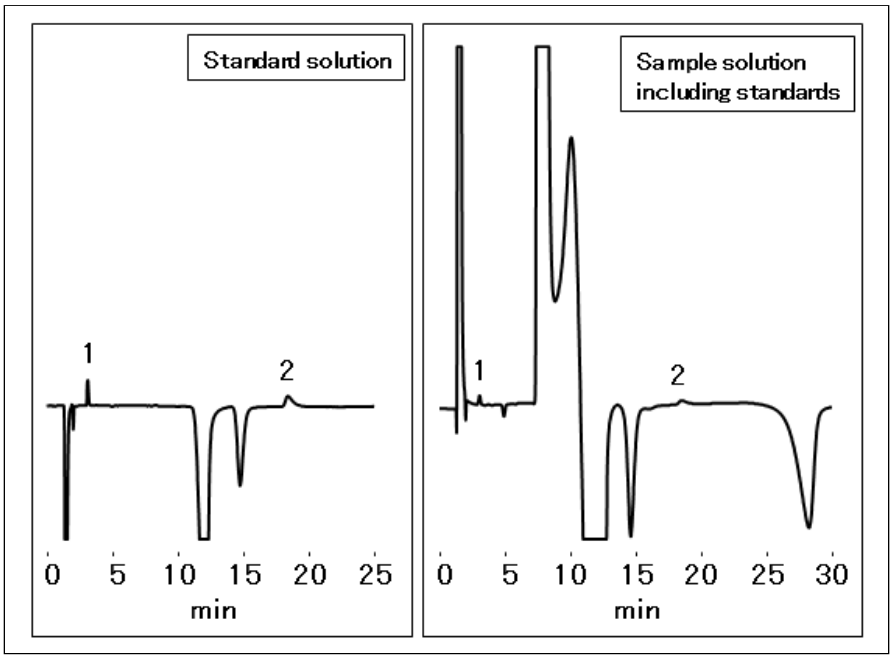
Analysis of Sulfamic Acid and Ammonium Thiocyanate According to Testing Methods for Fertilizers (2016) (NI-424)

In the production of ammonium sulfate, a common nitrogen fertilizer, there is a possibility of contamination by sulfamic acid and ammonium thiocyanate during the production process, and this has been known to cause germination failure in plants. In this application, a standard solution of sulfamic acid and ammonium thiocyanate, as well as a sample solution containing ammonium sulfate and the addition of the standards was prepared. The analysis was performed with a IC NI-424 column, an anion analysis column described in the 2016 testing methods for fertilizers. It was confirmed that sulfamic acid and ammonium thiocyanate were measured without any influence of impurities in the sample solution including standards.

Sample Solution preparation:
1. Add 1500 µg each of sulfamic acid and ammonium thiocyanate to 1g of ammonium sulfate.
2. Dissolve the mixture in water and make up to 100mL.
3. With the aqueous solution, perform a 12.5-fold dilution with water, then filter it with a 0.45 µm filter to obtain the sample solution.



Sample : 20 µL
Standard solution (Sulfamic acid and Ammonium thiocyanate 3mg/L each in H_2O)
Sample solution including standards (Sulfamic acid and Ammonium thiocyanate 1.2mg/L each in 800mg/L Ammonium Sulfate solution)
1. Sulfamate
2. Thiocyanate

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Column       : Shodex IC NI-424 (4.6mmI.D. x 100mm)
Eluent       : 0.5mM Phthalic acid + 4.0mM p-Hydroxybenzoic acid
               + 0.9mM Sodium 1-Octanesulfonate + 2.0mM Sodium 1-Hexanesulfonate
               + 100mM Boric acid aq.
Flow rate    : 1.0mL/min
Detector     : Non-suppressed conductivity
Column temp. : 58°C
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