Determination of Germanium in Spring Water by HG-AFS

The concentration of Germanium in drinking water and spring water is very low, therefore it is difficult to measure it directly by a traditional method. Due to the high sensitivity and excellent detection ability of the hydride generation atomic fluorescence spectrometer we are now able to test for Germanium with this type of technology.

1.Major equipment and reagents.

AI3300 atomic fluorescence spectrometer.

KBH_4 solution (2.0% KBH_4 in 0.5%NaOH):

Measure 1.0g of NaOH, then dissolve in 500mL of distilled water and add 1.0g HBH_4.

Germanium standard solution:

Commercial available Germanium standard solution (1000ppm), diluted to 5, 10, 20, 40 ppb.

H_3PO_4 solution (10%)

High pure argon (>99.99)

High pure distilled water

2. Method

Place 90mL spring water sample in a 250mL beaker. Add 10mL concentrated H_3PO_4, and mix well keep mixing until the solution is clear and stay till clear.

3. Instrument parameters

Carrier gas	400mL/min
Shield gas	800mL/min
HCL current	120mA
PMT voltage	420V
Integration time	6 s
Pump speed	40 r/min
Reducing reagent solution	2.0% KBH_4 in 0.5%NaOH

4. Results

This method gives:

Detection limit: 2.5ppb,

Recovery rate: 92~112%

Relative standard deviation: 3~8%