Determination of Selenium in Fish Meat by HG-AFS

Selenium is one of the essential trace elements found in the human body. Various diseases are related to the lack of selenium**,** given that this element is important for metabolism, health and growth. Hydride generation atomic fluorescence spectrometer has been often used to measure selenium in fish meat.

1. Major equipment and reagents.

AI3300 atomic fluorescence spectrometer with Se lamp.

Selenium standard solutions:

Commercial available selenium standard solution (1000ppm), diluted to 10ppm.

KOH solution:

Dissolve 2.50g KOH in 500 mL distilled water.

KBH4 solution:

Dissolve 20.0g KBH_4 in 500 mL (5g/L KOH) solution.

Concentrated HNO_3 (65~68%);

Concentrated HCl (36~38%);

Concentrated $HClO_4$ (70~72%)

H_2O_2 (30%)

High pure argon (>99.99%)

High pure distilled water.

2. Method

Measure 5.000g of fish meat in an Erlenmeyer flask, add 16mL HNO_3, and let it sit over night. Add 2mL $HClO_4$, place it on a hot plate and warm it until the total volume is reduced to ~1mL. Add 5mL 6N Hcl, heat to boiling and then let it cool down. Transfer to 25mL to a volumetric flask and add 6N HCl to make the total volume be 25mL. Measure the selenium concentration directly by using the Atomic fluorescence spectrometer, AI 3300.

3. Instrument parameters

Carrier gas	400mL/min
Shield gas	800mL/min
HCL current	100mA
PMT voltage	420V
Integration time	6 s
Pump speed	50 r/min
Reducing reagent solution	2.0% KBH_4 in 0.5% KOH

4. Results

This method gives:

Detection limit: ~8ppb,

Recovery rate: 96~103%

Relative standard deviation: 2~6%