

# Atomic Absorption Method Guide

## As in low alloy steel

### Key Words

- Low Alloy Steel
- Gunmetal
- Arsenic
- Hydride Generation
- Atomic Absorption

### Principle

The sample is digested with aqua regia and pre-reduced using potassium iodide. Arsenic is determined by hydride generation atomic absorption spectrometry using the VP90 Continuous Flow Vapour System.

### Reagents

**Aqua regia** (3:1 concentrated hydrochloric - concentrated nitric acids)

**Hydrochloric acid** (AnalaR grade, concentrated, s.g. 1.18)

**Sodium borohydride solution** (AnalaR grade, 1% m/v in 0.05% m/v sodium hydroxide)

**Pre-reducing solution** (AnalaR grade, 20% m/v potassium iodide)

**Arsenic master standard** (1000mg/L)

**Arsenic sub-stock standard solution** (200µg/L)

Transfer 0.2mL of arsenic master standard solution to a 1L volumetric flask and dilute to volume with deionised water.

### Working standards

Transfer 0, 2.5, 5.0, 7.5 and 10mL of the arsenic sub-stock standard solution into a series of 100mL volumetric flasks. Add 20mL of deionised water, 20mL of hydrochloric acid and 25mL of the pre-reducing solution to each flask and dilute to volume with deionised water. The working standards will contain 0, 5, 10, 15 and 20µg/L of arsenic.

### Sample Preparation

Weigh 0.2000g of alloy into a 100mL beaker, add 15mL of aqua regia and allow the mixture to stand until the sample has dissolved. Transfer the mixture to a 500mL volumetric flask and dilute to volume with deionised water. Transfer a 5mL aliquot of this solution to a 100mL volumetric flask, add 20mL of deionised water, 20mL of hydrochloric acid and 25mL of the pre-reducing solution and mix thoroughly. Dilute to volume with deionised water and allow the mixture to stand for 3 hours at room temperature.

### Instrument Parameters

Figure 1 Instrument parameters

## Results

Sample	BCS 1831/4	BCS 207/2	BCS 406/21	BCS 410/2
Arsenic found (% m/m)	0.131	0.062	0.12	0.0057
Reference value (% m/m)	0.13	0.066	0.12	0.0053

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