Application Note:
AN40157_E 10/03C

Atomic Absorption Method Guide
Ti in copper alloys

Key Words
- Copper Alloys
- Titanium
- Flame
- Atomic Absorption

Principle

The sample is digested in nitric/hydrochloric acid, and titanium is determined by flame atomic absorption spectrometry using a nitrous oxide-acetylene flame. Standard solutions matched for copper content are used to compensate for the interference of copper on titanium.

Reagents

Nitric acid (AnalaR grade, concentrated, s.g. 1.42)

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

Pure copper metal (e.g. BCS reference material number 197f)

Titanium master standard (1000mg/L, Spectrosol or equivalent)

Working standards

Weigh four 1.00g portions of pure copper into four 100mL volumetric flasks. Add 20.0mL of deionised water and 10.0mL each of nitric and hydrochloric acids. Allow to stand until the copper has dissolved. Add 0, 0.5, 2.5 and 5.0mL of the titanium master standard to the flasks and dilute to volume with deionised water. The working standards will contain 0, 5.0, 25.0 and 50.0mg/L of titanium.

Sample Preparation

Weigh 1.000g of copper alloy into a 100mL volumetric flask, add 20.0mL of deionised water and 10.0mL each of nitric and hydrochloric acids. Allow the mixture to stand until the sample has dissolved and dilute to volume with deionised water. 50mg/L in solution is equivalent to 0.5% m/m of titanium in the original sample. For higher concentrations, this solution can be diluted with a 1% m/v solution of high purity copper made in the same way.

Instrument Parameters

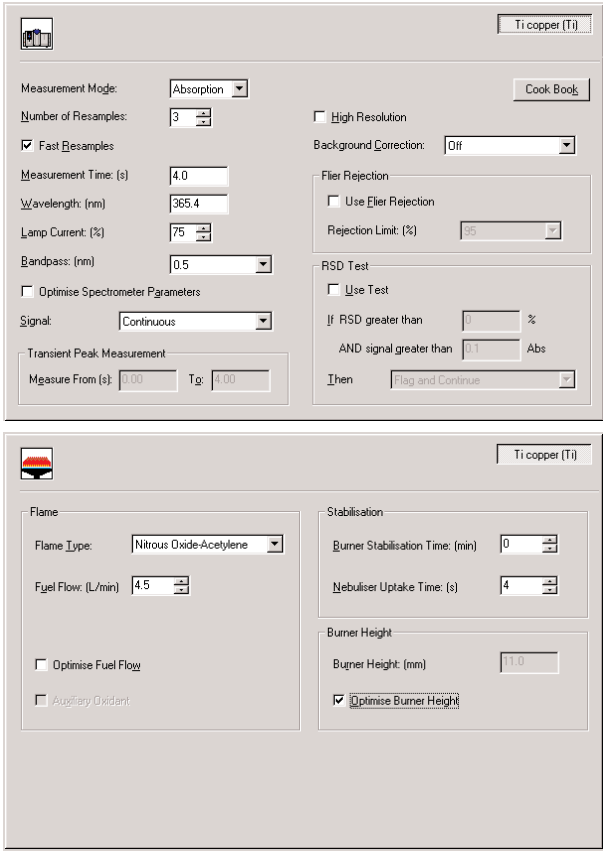

Figure 1 Instrument parameters

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Results

Sample	BCS 181/2	BCS 182/2	BCS 216/1	BCS 262	BCS 263/1	BCS 268
Titanium found (% m/m)	0.02	0.10	0.095	0.095	0.04	0.015
Reference value (% m/m)	0.019	0.11	0.107	0.1	0.04	<0.02

The method of sample treatment described in this publication should be performed only by a competent chemist or technician trained in the use of safe techniques in analytical chemistry. Users should acquaint themselves with particular hazards which may be incurred when toxic materials are being analysed and handled in the instruments, and the instrument must be used in accordance with the operating and safety instructions given in the Operators manual.

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