Ca

Calcium

A.W. 40.08

▼ Preparation of standard solutions

Recommended standard materials

Calcium carbonate $CaCO_3$

Solution technique

Dissolve 2.497 g of dried calcium carbonate in a minimum volume of 1:4 nitric acid. Dilute to 1 litre to give 1000 µg/mL Ca.

▼ Recommended instrument parameters

Atomic absorption

WORKING CONDITIONS (FIXED)

Lamp current	10 mA
Fuel	acetylene
Support	nitrous oxide
Flame stoichiometry	reducing; red cone 1-1.5 cm high

WORKING CONDITIONS (VARIABLE)

Wavelength nm	Slit width nm	Optimum working range µg/mL
422.7	0.5	0.01-3
239.9	0.2	2-800

Flame emission

Wavelength	422.7 nm
Slit width	0.1 nm
Fuel	acetylene
Support	nitrous oxide

Maximum intensity is obtained with an oxidizing nitrous oxide-acetylene flame (red cone 1 mm high).

▼ Interferences

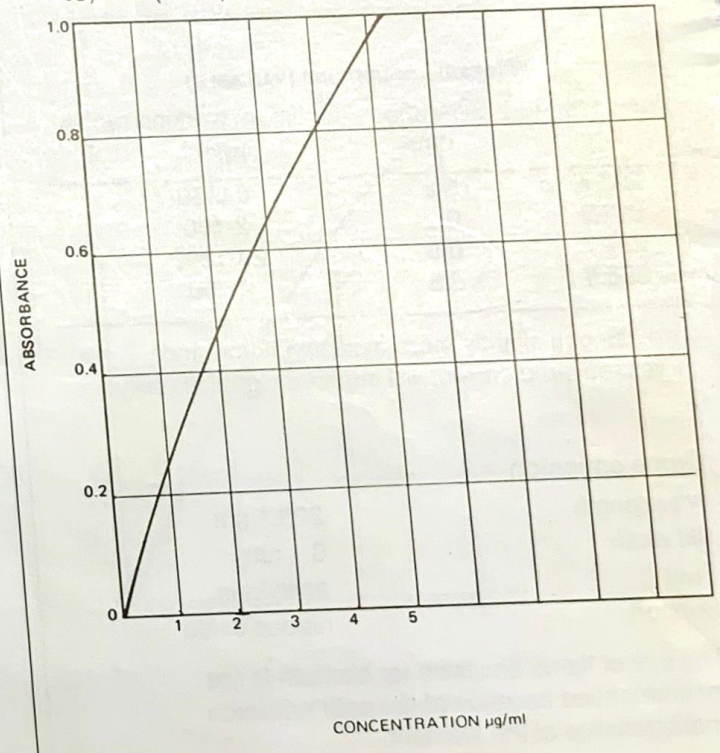
Chemical interferences in the air-acetylene flame are pronounced and have been fairly well documented (1,2,3,4). These interferences which depress the calcium absorbance can be eliminated by the introduction of a releasing agent such as strontium (5000 µg/mL) or lanthanum (10000 µg/mL). Normally the addition of a releasing agent is used in conjunction with the practice of matching sample and standard solutions to obviate combined interference effects.

The presence of excess sodium or potassium causes 5-10% signal enhancement due to suppression of ionization.

In the nitrous oxide-acetylene flame the main interference is caused by ionization of calcium itself. This is overcome by the addition of a more readily ionizable element such as potassium (2000-5000 µg/mL).

▼ References

1. Adams, P.B. and Passmore, W.O., *Anal. Chem.*, **38**, (4), 630 (1966).
2. Ramakrishna, T.V., et al., *Anal. Chim. Acta.*, **40**, 347 (1968).
3. Hwang, J.Y., and Sandonato, L., *Anal. Chim. Acta*, **48**, 188 (1969)



Standard conditions