

Interference

Any type of hindrance during analysis is called **interference**

There are three types of interference

Spectral Interference

Chemical interference

Physical Interference.

1) Spectral Interference

The radiations that are reaching to the detectors from the source other than element or analyte is called spectral interference. For example Spectral interference caused by the interference or overlapping of band or lines of an impurity element at a wavelength of a element to be measured.

In **Flame Emission analysis** of sodium at 590nm, the presence of calcium in the sample give spectral interference because calcium can form thermally stable compound CaOH in flame which emits orange band of radiations which overlap at 590nm.

In **Atomic Absorption analysis**, the manganese triplet (4031, 4033, 4035 °A) overlap with gallium lines (4033°A)

How to minimize the spectral interference ?

By using monochromator having sufficient resolution which ensure only the sharp emission lines of interest is measured.

2) Physical Interference

The physical properties like viscosity, density and vapor pressure etc can be changed by salt, acids or organic substances.

It cause transport interference.

It can change the rate of evaporation of solute and solvent.

It can change the flame temperature.

Viscosity affect the rate of atomization in total consumption burner.

It does not effect in premix burner because in this atomizer premixing occur, only analyte pass away.

How to minimize the physical interference?

1)Physical properties of sample solution and standard solution should be same

2)To minimize the interference, some times diluted or concentrated solution required by adding acids, salts or organic substances.

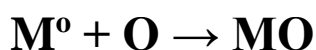
3) **Chemical Interference:**

Chemical interference are those in which some kind of chemical compound is present or formed in the flame which decrease the population of free metal atoms

Chemical interference may effect the flame emission and atomic absorption spectra.

Many elements form oxides and hydroxides in flame.

Typical compounds of burned gas mixtures are atomic or molecular hydrogen or oxygen and neutral or negatively charged hydroxyl radicals. These reactive species oxygen tom and hydroxyl radicals induce the formation of oxides or hydroxides.



How to minimize the Chemical interference?

Use the flame as hot as possible at high temperature , the degree of dissociation increase.

By Ionization

Interference also caused **by ion formation in the flame**. Lack of recognition and control of this problem can produce either positive or negative errors in an

analysis. This effect is responsible for anomalous curvature in the calibration curve

- a. All of the alkali metals show this interference in the acetylene-air flame.
- b. Most elements show this interference in the acetylene-nitrous oxide flame