

DETERMINATION OF BORON IN WATER BY FLUORIMETRIC METHOD

INTRODUCTION

The method is designed to measure mass concentration of boron in samples of natural, drinking, and waste water by fluorimetric method using the FLUORAT®-02 analyzer.

MEASUREMENT RANGE

Measurement range, mg/L	Directives & standards for drinking water	MAC (MPL), mg/L
0.05–2.5 (natural, drinking, and waste water)	WHO Guidelines for drinking water quality (2011)	2.4
	Drinking Water Directive 98/83/EC	1
	US EPA National Primary Drinking Water Regulations	4
	GB 5749-2006	0.5
	IS 10500:2012	0.1/1.5
	Resolução CONAMA No 396/2008	0.5

Samples with higher boron content should be diluted prior to analysis. Up to 1 g/L of ammonium, alkali metal ions, calcium, magnesium, aluminum, up to 100 mg/L of phosphate and up to 10 mg/L of fluoride, zinc, lead, copper, and iron do not interfere.

METHOD

Fluorimetric method for the determination of boron is based on the complex formation of borate ions with chromotropic acid in the presence of *N,N,N',N'*-ethylenediaminetetraacetic acid, disodium salt (EDTA disodium salt) as a masking agent for heavy metal ions. The intensity of fluorescence of formed complex is measured by FLUORAT®-02 analyzer and displayed as boron concentration in mg/l. The result appears on PC-operated software FLUORATE.



ADVANTAGES OF THE FLUORIMETRIC METHOD

There are several advantages of fluorimetric analysis compared with conventional photometric techniques:

- Higher sensitivity and lower detection limit
- Enhanced selectivity enabling interference-free analysis
- The result is displayed immediately after mixing the sample and reagents – quick and simple step-by-step procedure
- Lower cost per analysis

EQUIPMENT AND REAGENTS

The following equipment and reagents (analytical grade) are used for measuring:

- FLUORAT®-02 analyzer with software FLUORATE
- Lumex Instruments optical filters *
- SRM boron stock solution (1 mg/mL) *
- Chromotropic acid, disodium salt dihydrate (CAS 5808-22-0) *
- PTFE or polypropylene vessels *
- *N,N,N',N'*-ethylenediaminetetraacetic acid, disodium salt dihydrate (CAS 6381-92-6)
- Sodium hydroxide
- Distilled water

* included in Lumex Instruments “Boron in water” set, order code 30002540

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To get more specific information, please contact the representative by sales@lumexinstruments.com