



DETERMINATION OF ALUMINIUM IN WATER BY FLUORIMETRIC METHOD

INTRODUCTION

Aluminium is the most abundant metallic element and its salts are widely used as coagulation treatment agent. In the same time increased levels of aluminium may lead to renal diseases and cause undesirable colour and turbidity of distributed water.

There are practicable levels of aluminium in water based on optimization of the coagulation process at drinking-water plants: 0.1 mg/L or less for large water-treatment facilities and 0.2 mg/L or less for small.

Lumex Instruments provides accurate and selective fluorimetric method for the measurement of the mass concentration of aluminium in water samples using the FLUORAT-02 analyzer.

MEASUREMENT RANGE

Measurement range, mg/L	Directives & standards for drinking water	MAC (MPL), mg/L
0.01–50 (10 – 50 000 ppb) (natural, drinking, and treated waste water)	WHO Guidelines for drinking water quality (2011)	0.1 / 0.2
	Drinking Water Directive 98/83/EC	0.2
	US EPA National Secondary Drinking Water Regulations	0.05–0.2
	GB 5749-2006 Standards for drinking water quality	0.2
	IS 10500:2012 Drinking water – Specification	0.03 / 0.2
	Resolução CONAMA No 396/2008	0.2

The method can be applied to almost any type of water: natural, drinking, and treated waste water.

METHOD

The fluorimetric method for the determination of aluminium is based on the complex formation of aluminium ions with lumogallion in the acetic buffer solution (pH = 4.8–4.9) in presence of ascorbic acid as masking agents for iron ions.

The intensity of fluorescence of the formed complex is measured by the FLUORAT-02 analyzer and displayed as aluminium concentration in mg/l via PC-operated FLUORATE software.

For natural and treated waste water preliminary decomposition of organic substances is performed by wet ashing. For drinking water no decomposition required.

HIGHLIGHTS OF THE FLUORIMETRIC METHOD

- Affordable price for instrument and reagents
- Detection limit is lower, measurement range is about 10 times wider and selectivity is much higher compared with conventional photometric techniques

EQUIPMENT AND REAGENTS

The following equipment and reagents are used for measuring:

- FLUORAT-02 analyzer with FLUORATE software
- Lumex Instruments optical filters*
- RM of aluminium ion solution (1 g/l)*
- Lumogallion (CAS 4386-25-8), p.a.*
- Bidistilled or deionized water (grade 1; ISO 3696)
- Hydrochloric acid 37%, puriss.spec.
- Acetic acid, p.a.
- Ascorbic acid, p.a.
- Hydrogen peroxide, supra pur,
- Nitric acid, supra pur,
- Sodium acetate trihydrate, puriss.spec.

* — included in Lumex Instruments “Aluminium in water” set, order code **30002504**.

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