



DETERMINATION OF TOTAL PETROLEUM HYDROCARBONS (TPH) IN WATER BY FLUORIMETRIC METHOD

INTRODUCTION

Total petroleum hydrocarbons (TPH) is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil; the main and most specific part of these compounds are non-polar and slightly polar hydrocarbons of the aliphatic, aromatic and alicyclic structure. These compounds are harmful to humans and animals if absorbed through the skin, ingested, and inhaled thus claiming the analytical control of TPH content in water as a global issue.

Quantification of TPH in water is typically done using rather expensive chromatography techniques. Lumex Instruments developed fluorimetric method for cost-effective petroleum hydrocarbons in water determination using FLUORAT-02 analyzer.

MEASUREMENT RANGE

Measurement range, mg/L	Directives & standards for drinking water	MAC (MPL), mg/L
0.005 – 50 mg/l (5 – 50 000 ppb)	GB 5749-2006	0.3
	IS 10500:2012	0.5

The method can be applied to almost any type of water: natural, sea, tap, drainage water etc.

The determination of TPH in water is not affected by grease, edible oils, saturated hydrocarbons of natural origin, humic acids and related compounds.

METHOD

A fluorimetric method of determination of mass concentration of TPH using the FLUORAT-02 analyzer is based on measuring the fluorescence intensity of oil products after their extraction from water phase by hexane.

The influence of polar substances can be eliminated by treatment of the hexane extract of TPH with hydrochloric acid and sodium hydroxide solutions.

For the analysis of not treated wastewater in pulp and chemical industry, as well as in the case of high absorption of the hexane extract an additional clean-up procedure using column chromatography with aluminium oxide is required.

HIGHLIGHTS OF THE FLUORIMETRIC METHOD

- Versatility in use – almost any water sample can be analyzed;
- Almost no interference from natural organic compounds;
- The method is more cost-effective solution comparable to chromatography techniques being the same or better in terms of sensitivity and accuracy.

EQUIPMENT AND REAGENTS

The following equipment and reagents are used for analysis:

- FLUORAT-02 analyzer with FLUORATE software
- Lumex Instruments optical filters*
- RM of TPH solution*
- RM of TPH in a solid water soluble matrix (to control the quality of the measurements)*
- *n*-Hexane for UV spectroscopy
- Reagent water complying with grade 1 as defined in ISO 3696
- Hydrochloric acid ultra or p.a.
- Sodium hydroxide ultra or p.a.

For a clean-up procedure of the extract using column chromatography:

- Glass chromatographic column (10x200 mm) for clean-up procedure*
- Aluminium oxide for chromatography, activated, neutral*
- Muffle furnace providing the stable heating mode from +150 up to +600 °C

* — included in Lumex Instruments "Total petroleum hydrocarbons (TPH) in water" set, order code **300002610**

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