



DETERMINATION OF **TOTAL PETROLEUM HYDROCARBONS (TPH)** IN SOIL 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.

The control of TPH in soil is highly important because oil and oil products are toxic to plants, animals, and humans and reduce soil quality and fertility.

With the FLUORAT-02 analyzer, accurate, sensitive and cost-effective fluorimetric determination of TPH in soil is possible according to the most up-to-date regulatory documents, for example, with the draft standard GB 15618 "Soil environmental quality standard for agricultural land".

MEASUREMENT RANGE

The range of measured TPH content is **5 – 20 000 mg/kg** (5 – 20 000 ppm).

The determination of oil products is not affected by humic and fulvic acids, fats, and other natural components.

METHOD

A fluorimetric method for the determination of the TPH content in soil is based on the extraction of oil products from the sample by hexane (*Method A*, for slightly contaminated soils) or chloroform (*Method B*, for heavily contaminated soils). For *Method B* purification by column chromatography is required.

Fluorescence intensity of an extract is measured by the FLUORAT-02 analyzer and the final result is displayed by FLUORATE software as TPH content in the soil sample in mg/kg.



HIGHLIGHTS OF THE FLUORIMETRIC DETERMINATION OF TPH USING FLUORAT-02

- The method can be applied for soils of any type
- Almost no interference from natural organic compounds
- Affordable instrumentation and accessories price, low running cost
- Small footprint and rugged construction
- Fluorimetric method is highly sensitive and provides reliable results quicker and in more convenient way than conventional gravimetric and GC techniques

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 for calibration*
- *n*-Hexane for UV spectroscopy
- **For a clean-up procedure of the extract using column chromatography (Method B):**
- Chloroform, puriss.
- Glass chromatographic column (10x200 mm) for clean-up procedure*
- Muffle furnace providing the stable heating mode from +150 up to +600 °C
- Aluminium oxide for chromatography, activated, neutral*

* – included in Lumex Instruments "Total petroleum hydrocarbons (TPH) in soil" set, order code **300002601**

The contents of this paper are subject to change without notice.

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