

Method

Detection of total petroleum hydrocarbons (TPH) in soil can indicate contamination from leaking underground storage tanks (USTs), petroleum refineries, or other fuel sources.

The Friedel Crafts Method

References: U.S. Patent #5,834,655. U.S. Patent #4,992,379. EPO Application #94 302 944. Roberts, R. M. and Khalaf, A. A., Friedel Crafts Alkylation Chemistry: A Century of Discovery, Marcel Dekker, Inc., NY, (1984). Schmid, George H., Organic Chemistry, Mosby-Yearbook, Inc., QD251.2S354, p. 935 (1996).

The RemediAid™ Total Petroleum Hydrocarbon Test is a rapid, simple field test for measuring aromatic petroleum hydrocarbon contamination in soil. The patented test is based upon the Friedel-Crafts Reaction with one fundamental difference—the intermediate that is formed in the solvent is the colored species that is measured.

The RemediAid Test determines TPH across a wide range of soil types and petroleum products. RemediAid allows the user to analyze for specific fractions, including: BTEX, PAH, diesel fuel, leaded and unleaded gasoline, brent crude, and lubricating oil.

In the test method, a pre-measured sample of soil is added to a reaction tube that contains anhydrous sodium sulfate, a drying agent. A pre-measured volume of dichloromethane is then added to the reaction tube. This organic solvent extracts the petroleum hydrocarbons from the soil sample. In order to remove polar hydrocarbons and color interferences, the soil extract is treated with Florisil. Finally, a vacuum-sealed ampoule, containing aluminum chloride, draws in a predetermined volume of the hydrocarbon-containing solvent. The hydrocarbons in the solvent react with the aluminum chloride to produce a soluble colored product directly proportional to the petroleum hydrocarbon concentration in the sample. The absorbance of the sample is measured in a portable, battery-powered, LED-based colorimeter and converted to mg/kg hydrocarbon in the soil by use of a formula.



Instrumental Kit

Ranges¹:

Unleaded Gasoline: 80-600 mg/kg

Diesel: 60-400 mg/kg

Brent Crude: 40-400 mg/kg

Lube Oil: 120-1000 mg/kg

BTEX: 16-140 mg/kg

Leaded Gasoline: 80-520 mg/kg

PAH (16 component mixture): 8-60 mg/kg

Method: Friedel Crafts

	Cat#
RemediAid (TPH) Starter Kit (No Consumables)	I-9312

RemediAid (TPH) Starter Kit comes in a plastic case and contains TPH Photometer, pocket scale, 3-channel timer, TPH reaction tube plug/snapper, tip-breaking tool, 4 AAA batteries, screwdriver, and instruction booklet.

RemediAid (TPH) Refill (for use with I-9312)	R-9310
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Refill comes in a cardboard box and contains 16 tests, two 30 g bottles of sodium sulfate and reagent blank ampoule.

NOTE: R-9310 TPH Refill must be purchased separately from I-9312.

Kit Components common to TPH

Description	Cat#
Tip Breaking Tool (2 ea)	A-0197
Reagent Blank Ampoule Pack (2 ea)	A-0161
Sodium Sulfate, two 30 g bottles	A-0162 ²
TPH Reaction Tube Plug/Snapper (1 ea)	A-0168

¹Expected dynamic range of the test in soil sample matrix (The instructions include dilution procedures, if an extended range is required.).

²Consumption of this accessory is solely dependent on the moisture content of the soil being tested. If the soil being tested has a moisture content above 10%, the bottle of sodium sulfate will be depleted after approximately 8 tests.

Instructions and MSDS(s) are posted on our website.

If no shelf-life is listed for a product, then the shelf-life is at least 2 years.