

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, p. 790 (1984). Schmid, George H., Organic Chemistry, Mosby-Yearbook, Inc., QD251.2S354, p. 935 (1996).

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

The RemediAid™ Total Petroleum Hydrocarbon Test Kit 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 Kit 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, weathered 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: 40-370 mg/kg

Weathered Gasoline: 40-360 mg/kg

Diesel: 60-880 mg/kg

Brent Crude: 60-770 mg/kg

Lube Oil: 160-2160 mg/kg

BTEX: 20-150 mg/kg

Leaded Gasoline: 40-470 mg/kg

PAH (18 component mixture): 8-70 mg/kg

Method: Friedel Crafts

	Cat#
TPH Kit	K-9310
TPH Refill, 16 ampoule sets	R-9310

Kit comes in a plastic case and contains everything needed to perform 8 tests: eight ampoule sets, TPH photometer, tip breaking tool, light shield, pocket scale, 3-channel timer, TPH reaction tube plug/snapper, spatula (8 ea), 80 g bottle of sodium sulfate, reagent blank ampoule, ampoule rack, 9V battery, instruction booklet, instruction card, and MSDS.

Kit Components common to TPH

Description	Cat#
Tip Breaking Tool (1 ea)	A-0079
Light Shield (1 ea)	A-0138
Scale, Pocket (1 ea)	A-0156
Timer, 3-Channel (1 ea)	A-0157
Ampoule Rack, holds 36 (1 ea)	A-0158
Spatula Pack (50 ea)	A-0160
Reagent Blank Ampoule Pack (2 ea)	A-0161
Sodium Sulfate, 80 g bottle	A-0162 ²
TPH Reaction Tube Plug/Snapper (1 ea)	A-0168
TPH Photometer (1 ea)	A-9310

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 10 tests.

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