



Equipment Required

UVF-Trilogy 7200-004-FNGP model, glass cuvette, tissue wipes, solvent, dispenser bottle, micro-pipette, notebook to record results.

Four UV modules: GRO, EDRO, PAHS and TPHOIL. Be sure the proper module is installed for each test performed.

PAH and GRO Calibration Kits: Use with UV modules for GRO, Total PAHs, Target PAHs and Heavy PAHs to check factory calibrations.

Sample Kit, p/n EXTR010-20-WATER: Includes laboratory supplies needed. Use with hexane and methanol solvents to prepare samples.

Dispose solvent waste properly. Hexane and methanol solvents are flammable!

Set up Analyzer

Insert UV Module

Choose "UV" when prompted to select and confirm the module being used

Turn the instrument on using the switch in the back. Open the lid and insert the UV module down into position. Be sure you are using the correct module for each test. Press "Calibrate" and then press "Use Stored Calibration." Choose the test you want and press "Select." The screen will display a green "MEASURE FLUORESCENCE" button with test name shown below it.

Analyzer is factory calibrated to four tests to use: GRO, TOTAL-PAH, TARGT-PAH and HEAVY-PAH. Oil samples are extracted and diluted in solvent at low concentrations for analysis. Response and ratios exhibited in the readings are used for hydrocarbon fingerprinting by comparing results to different oils or fuels of known origin.

1. Prepare a 10,000 ppm Extract in Hexane

Extraction Vial, 10 mL Line, Test Tube, Hexane Solvent, Pipette 100 uL Oil, Oil Sample, Extraction Vial, Extracts should be CLEAR and not cloudy or emulsified.

Fill the solvent dispenser bottle with Hexane and squirt 10 mL of solvent into a glass extraction vial or use a plastic graduated test tube for more precise measurements. Attach a pipette tip to the micro-pipette, set dial to "100" and transfer 100 uL of oil sample in the extraction vial. Use a tissue wipe to remove any extra oil stuck to the outside of the pipette tip, if necessary. This creates a 10,000 ppm concentrated oil Extract. Screw cap on tightly and shake vial for several seconds for oil to dissolve into the solvent. Label concentration on vial with a marker.

Light-refined petroleum products will also extract in Methanol solvent. Compare results using the two solvents for additional forensic data. Extraction efficiency can vary using polar (Methanol) vs. non-polar (Hexane) solvents. Hexane is a more powerful solvent and will extract asphaltenes in the oil, methanol will not.

2. Prepare Dilutions in Methanol or Hexane for Analysis

Prepare 100 ppm Standard first, Extract, Test Tube, 5 mL Line, Methanol or Hexane, Adjust Pipette, Use additional test tubes.

Fill the solvent dispenser bottle with methanol and use this solvent instead when making dilutions with the Extract. Methanol dissolves hexane extracts sufficiently at the 100 ppm concentration. Methanol should be used for UVF-Trilogies factory calibrated using GRO and PAH standards in methanol for soil analysis. For UVF-Trilogies calibrated using GRO and PAH standards in hexane for water analysis, make dilutions using hexane. Dilutions or oil "Standards" created below are reusable. Store standards in the small glass extract vials – supplied in the kit – instead of the plastic test tubes for longer shelf life.

100 ppm Standard: Pipette 50 uL of the Extract into a test tube and dilute to the 5 mL line with solvent. Use this Standard to create additional dilutions below:

10 ppm Standard: Pipette 250 uL 2 times of the 100 ppm Standard into 5 mL solvent using a test tube.

5 ppm Standard: Pipette 250 uL of the 100 ppm Standard into 5 mL solvent using a test tube.

1 ppm Standard: Pipette 50 uL of the 100 ppm Standard into 5 mL solvent using a test tube.

3. Test Samples

Glass Cuvette, Trilogi screen showing MEASURE FLUORESCENCE button.

Pour the 1 ppm Standard into the glass cuvette, place into the UV module, close the lid and press the green "MEASURE FLUORESCENCE" button to analyze. Record the reading (PPM response) for all four tests. Avoid spilling the cuvette when switching out the UV modules. Pour back into test tube when finished. Test the 5 ppm, 10 ppm and the 100 ppm Standards in order, recording the GRO and PAH responses at each concentration. Rinse the glass cuvette with solvent after each use. Test a solvent blank to ensure it's clean, if needed.

4. Record and Calculate Results

EXAMPLE	Test 1	Test 2	Test 3	Test 4
Sample Response	GRO TOTAL	PAH	TARGET PAH	HEAVY PAH
1 ppm =	0.33	0.41	0.09	0.00
5 ppm =	1.5 ✓	2.1 ✓	0.4 ✓	0.03
10 ppm =	3.0 ✓	4.0 ✓	0.8 ✓	0.05 ✓
100 ppm =	24	33	6.8	0.49 ✓

%Aromatics = 30% 40% 8% 0.5%

Calculate percentage of hydrocarbon content: for each test: **Response ÷ Concentration x 100**. Only use response values that are LINEAR ✓ and not quenching. Avoid readings below the detection limit or above the upper linear range of each test (see calibration instructions). Next, compare results to other samples you've tested of known origin or use Sitelab's database to help identify the type or age of petroleum.

See TPH fingerprinting instructions for details