

Crude-Oil in Water Handheld Fluorometer Kit

Background:

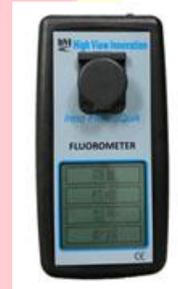
PAHs (Polycyclic Aromatic Hydrocarbons) are one of the most widespread organic pollutants. In addition to their presence in fossil fuels, they are also formed by incomplete combustion of carbon-containing fuels such as wood, coal, diesel, fat, tobacco, and incense. Due to their physical properties, PAHs are widely used in many industrial applications, such as lubricating oil, hydraulic oil, and electro-hydraulic control fluid. Their applications also could produce man-made contamination in the water systems due to leakage of the oils.

Fluorescence Detection:

The aromatic fraction of PAHs can be excited with UV or near-UV light to emit fluorescent light. The fluorescence intensity is linear with the concentration of the oil. This technology is ideal for monitoring leaking lube oil in the cooling systems or power plants, or leaking crude oil in ocean/lake environment. hVI's handheld fluorometer is designed for crude oil detection and monitoring. Due to the low interference from other substances, we have proven that this technology can detect sub-mg/ L (< 1-ppm) level of crude oil contamination in water samples from the environment. And due to its high portability, it can be used anywhere in the field to conduct environmental inspection for potential oil contaminations.

Fluorometer Specifications:

- Uses standard 1-cm plastic cuvette for easy sample collection.
- Rapid (5 seconds reading) and highly sensitive (<1ppm)
- Wide measurement range (0 - 10,000 ppm with proper calibration).
- Simple touch screen calibration. No repeated calibrations needed.
- Powered by 4xAA batteries or 5VDC Power Adaptor.
- Portable for field operation, and stores up to 3x80 data points for computer analysis.
- Dimension (L x W x H): 185mm x 90mm x 35mm



Field Kit includes:

- Handheld Fluorometer, with USB Cable, 5VDC Power Supply, and manual/data-management software CD.
- Texas crude oil standard, 1% in Acetone, 2 mL. (For reference only)
- Disposable 500- μ L Transfer Pipette: 30 pcs
- 1-cm Plastic Cuvette with Cap: 64 pcs

Procedures:

1. Add 1-mL of water sample into a cuvette as "Sample". Filter the water to reduce turbidity first if needed.
2. Add the same amount of dH₂O into another cuvette as "Blank".
3. If the fluorometer has not been calibrated, prepare one standard solution according to your own procedure and measurement range. For example, dilute 10- μ L of our standard into 0.99 mL of dH₂O into another cuvette as 100-ppm "Standard".
4. Switch on the fluorometer. To calibrate the fluorometer, place the "Blank" tube into the sample holder. Close the cover. From the Main screen, press [Calibrate] → [Confirm] → [Assay 1] (or another assay number you like) → [Blank].
Fluorometer starts measuring. After the blank is measured, place the "Standard" tube into the sample holder and close the cover. Use the "<" and ">" arrow keys on the second row to move the underline to select the digit you want to change, and use the "+" or "-" keys to increase or decrease the value of the underlined digit to define the "Standard" value. Press [Measure]. If fluorometer shows "Calibration Finished", the fluorometer is now calibrated. Press [Return].
5. Measure: Place the "Sample" tube into the sample holder and close the cover. From the Main screen, press [Measure] → [Assay 1] (or the assay you selected earlier in calibration) → [Measure]. The oil concentration will be displayed in the window. Record the data, or press [Save] to save the data for later retrieval. Press [Return] and then [Measure] for the next sample. Note: if "Sample" concentration is higher than the upper limit, dilute in dH₂O and repeat measurement.
6. In some cases where interference from other substances (such as CDOM) may be a concern, extract the oil from the sample following proper extraction procedures before doing the measurement.