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Evaluate the Application of TPH test kits to Identify the Potential Contaminants in Gas Stations

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This study is focusing on the utility and applicability of the portable equipments such as, photo ionization detector (PID) and flame ionization detector (FID) for the determination of contaminants during the investigation of various gas stations. According to the onsite screening results, high contaminated soil samples were sent to analytical laboratory for the detection and quantification of the contaminants present therein. However, due to limitations, PID and FID cannot detect the low vapor pressure components. Hence, they cannot reflect the real situation of the contaminated soil samples and areas. This study summarizes the analytical results of total 37 soil samples, collecting from 17 gas stations. Soil samples were not only analyzed according to the standard method of Taiwan EPA in the laboratory, but also tested using the Total Petroleum Hydrocarbon (TPH) test kits, following the USEPA method 9074, to evaluate the TPH concentration in soil samples. With test kits, onsite, first the TPH was extracted from the soil samples using methanol and then mixed with emulsifier to produce turbidity, and finally then measured using the turbidity meter. The TPH test kits method is simple and rapid, and not time consuming like the laboratory method. A positive relationship has been observed (co-efficient of determination, R2 = 0.74) comparing between the results obtained from the laboratory test and kits test methods, especially for the high carbon content oil such as, diesel, but it does not show the obvious relationship with gasoline. Number of advantages has been considered in using the TPH test kits including, easily portable, simple and rapid testing, cost-effective, and onsite quantification. The technique can be applied for high carbon content oil contamination sites during soil sampling, to realize the actual situations and the promoting confirmation efficiency.