

## Determination of Volatile Organic Compounds Contamination in Map Ta Phut Area



### Volatile Organic Compounds (VOCs)

Volatile organic compounds (VOCs) are the chemicals characterized by high volatility under environmental conditions. VOCs are often used in industry such as petroleum, paints and pharmaceuticals. In addition, some are applied as solvents, starting agents and additives. The contamination of VOCs in environment is critical for health due to their toxicity as neurotoxic and carcinogenic effects. Map Ta Phut Industrial Estate is the largest petrochemical industrial complex in Thailand. It is to be a major source of VOCs and other toxic chemicals released into atmosphere. The effects of air pollution on the health of the local residents living near the Map Ta Phut Industrial Estate have been concerned.



### Determination of Volatile Organic Compound in Environmental Samples

In this research the 9 VOCs conducted by the Pollution Control Department (PCD) were studied. The amount of benzene, vinyl chloride, 1,2-dichloroethane, trichloromethane, 1,2-dichloropropane, tetrachloroethylene, chloroform and 1,3-butadiene in soil, water and food samples collected from Map Ta Phut area was determined. The effective method for analysis of VOCs was developed. The gas chromatography-mass spectrometry (GC-MS) was used as the microgram level monitoring equipment. In addition, the purge and trap technique and solid phase microextraction was used as the extraction and preconcentration step prior to analysis. These techniques are acceptable by the USEPA.

### Results

Dichloromethane, chloroform and benzene were found in soil samples. Dichloromethane, chloroform, benzene, 1,2-dichloroethane and tetrachloroethylene were found in food samples. No any VOCs were found in all water samples. Vinyl chloride was not found in all samples due to its high volatility. However, the amount of VOCs in sample was low level as microgram per kilogram.

The higher amount of benzene and dichloromethane from vegetables growth in Map Ta Phut area was found when compare with vegetables collected from the market. In addition, there are no standard values of VOCs in food reported. Therefore, the health impact of VOCs contaminated in food found in this research cannot be assessed.

