Tracking air toxics at residential areas near a petrochemical complex by new real-time miniature VOC sensors

Ruei-Hao Shie 1; Tzu-Hsuen Yuan 1; Tsung-Kuan Chou 2; Li-Peng Wang 3; Chang-Chuan Chan 1

1 Institute of Occupational Medicine and Industrial Hygiene, Health, National Taiwan University, Taipei, Taiwan; 2 TRICORNTECH Corporation, Taipei, Taiwan; 3 TTRICORNTECH Corporation, San Jose, CA, United States

Background and aims
- This study aims to use a portable and real-time volatile organic compound (VOC) sensor to track the impact of air toxics in residential areas near a petrochemical complex.

Materials & Methods
- We set up on-line VOC sensors at a school at 2.0 km away from a major petrochemical complex in Taiwan, to measure refinery-related air toxics for one month.
- A portable and custom-made VOC sensor, MiTAP (TRICORNTECH Corp., Taiwan), was used to measure 5-minute concentrations of refinery-related air toxics continuously with a detection limit less than 0.5 ppb, including acetone, benzene and toluene.

Results
- The five-day monitoring data on targeted VOCs showed that both temporal and spatial patterns are related to the emission sources and geological locations of the petrochemical complex.
- The 5-minute air toxics concentrations varied widely within each day.
- The diurnal patterns indicated benzene was related to industrial emissions rather than traffic emissions.

Conclusion
- This study concluded that pollution roses based on the new real-time high-precision VOC monitoring device, MiTAP, can be used to investigate source contributions to air toxics pollution surrounding industrial complexes.

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