

Exposure Assessment and Air Dispersion Modeling

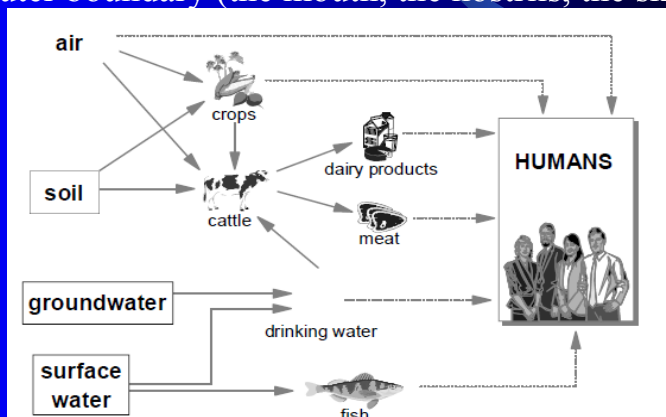
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VOCs Seminar in Thailand

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What is “Exposure” ?

- “Exposure” is the condition of a chemical contacting the outer boundary (the mouth, the nostrils, the skin, etc).



VOCs! EUSES version2.0 Background report, RIVM(Jan 2004) 15, 2006

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What is “Exposure Assessment”?

- “Exposure Assessment” is estimating the chemical concentration in the environmental media (“exposure concentration”), and/or the (possible) chemical dose.

Step of Exposure Assessment (1)

Step1; Estimation of Exposure Route

- Assuming possible routes to the outer boundary of a human of a chemical which is emitted from various emission sources

Step2; Estimation of Exposure Concentration

- Monitoring a (possible) chemical concentration in the air, drinking water, soils, foods etc, or estimating that by using the simulation model

Step of Exposure Assessment (2)

Step3; Estimation of (Possible) Dose

- Estimating a (possible) dose of a chemical by the inhalation, the ingestion of foods, etc
- Considering physiological characteristics (body weight, breathing quantity, etc) and/or behavior characteristics (time spent, frequency in the exposure area), intakes of foods, etc of the exposed individual or population

Estimation of Exposure Route of VOCs



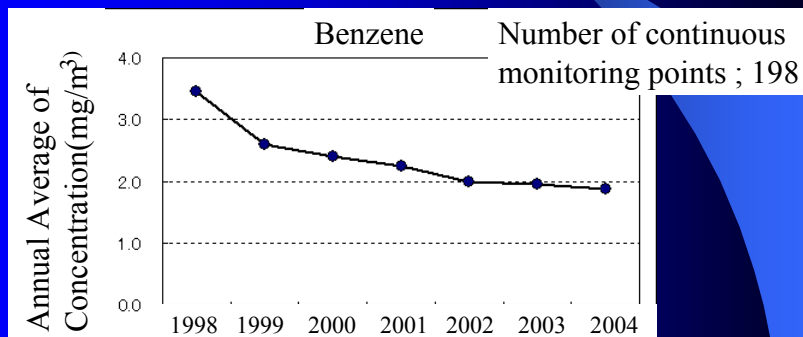
Estimating of Exposure Concentration of VOCs (1)

A) Monitoring Ambient Air Concentration of VOCs

Monitoring Method	Japan
Analytical methods	Established analytical methods for 12 VOC species
Sampling points	300-400 points
Sampling periods and frequency	24 hours sampling, up to 1 sampling/month

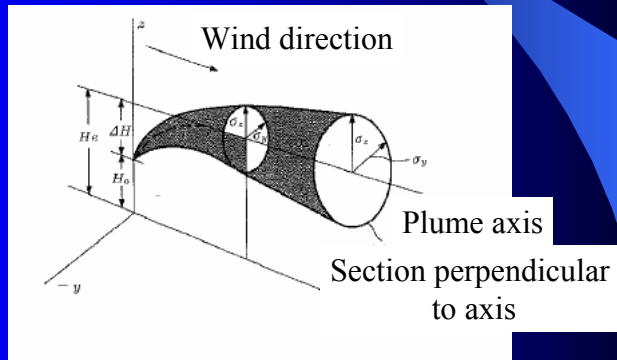
Estimating of Exposure Concentration of VOCs (2)

- Example of the monitoring data of Benzene in Japan



Estimating of Exposure Concentration of VOCs (3)

B) Estimating Ambient Air Concentration of VOCs by Using Air Dispersion Model



VOCs Sem AIST CRM ; <http://www.riskcenter.jp/metilis/>

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Estimating of Exposure Concentration of VOCs (3)

B) Estimating Ambient Air Concentration of VOCs by Using Air Dispersion Model

– METI-LIS

(Ministry of Economy, Trade and Industry, Japan

- Lowrise Industrial Source Dispersion Model)

- Dispersion simulation of air pollutants from low emission sources

– ADMER

(The Atmospheric Dispersion Model for Exposure and Risk Assessment)

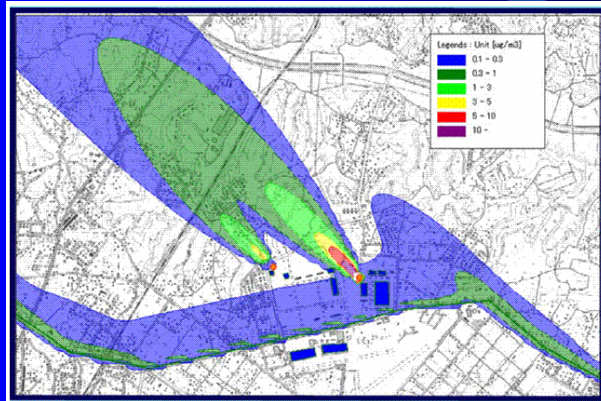
- Estimating model of the long-term average spatiotemporal distribution of chemicals in a comparatively wide region

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Estimating of Exposure Concentration of VOCs (4)

- Example of the estimating result by using METI-LIS

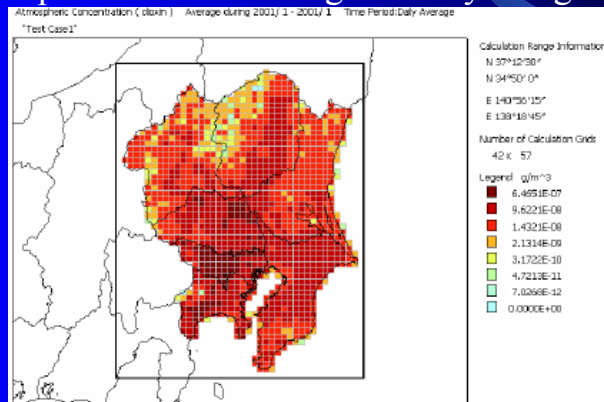


VOCs Sen AIST CRM ; <http://www.riskcenter.jp/metilis/>

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Estimating of Exposure Concentration of VOCs (5)

- Example of the estimating result by using ADMER



AIST CRM ; http://www.riskcenter.jp/ADMER/en/index_e.html

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Estimating of Intakes of VOCs

- Estimating of Intakes by the multiplication of the exposure concentration and the breathing quantity
 - Breathing quantity; 150m³/day (Japan)