

Health Risk Assessment of VOCs Found in Home Screening

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Volatile Organic Compounds

- Volatile = gas at usual temperatures
 - Exposed by breathing
- Organic = contain carbon atoms
- Some VOCs have health risks

Where Do VOCs Come From ?

- Many consumer products
- New home construction

Where Do VOCs Come From ?

- Paint, paint thinner, varnish, solvents
- Upholstery, carpet, water repellent fabric
- Gasoline, adhesives, cleaning products
- Dry cleaning, aerosol cans
- Pesticides, cigarette smoke, detergent

How Do We Learn about Health Risks ?

- Animal studies
 - Very high exposures
 - Much higher than human exposures
 - All parts of life cycle

Human Studies

- Disasters
 - High exposure, short-term
- ❖ Occupational
 - Medium exposure, medium-term, intermittent
- Community
 - Low exposure, long-term

Who Does the Studies ?

- National Institute for Occupational Safety and Health (NIOSH)
 - Research
- Occupational Safety and Health Administration (OSHA)
 - Sets and enforces allowed occupational exposures

Who Does the Studies ?

- Environmental Protection Agency (EPA)
 - Sets allowable environmental levels
 - Including RSL
 - Enforcement

Who Does the Studies ?

- Agency for Toxic Substances and Disease Registry (ATSDR)
 - Human exposure pathways
 - Health risk assessments

How Are Health Risks Determined ?

- Review all studies
 - Animal
 - Occupational
 - Any other human studies available

Cancer Is Not The Only Possible Health Effect

- Some chemicals don't increase cancer
- Most cancer takes decades to develop
- Many important health effects happen sooner

Health Effects Considered

- Lungs
- Liver
- Kidney
- Digestive
- Immune
- Fertility
- Cardiovascular
- Nervous system
- Immune system
- Blood
- Fetal development

How Are Acceptable Exposures Set ?

- From animal studies
- As much as 1,000 times lower than levels that cause health effects in animals

How Are Acceptable Exposures Set ?

- From human studies
- Lower than any level shown affect human health
- In most sensitive body system
- Plus additional safety margin

Most Conservative Exposure Levels

- No Observed Adverse Effect Level (NOAEL)
- Minimal Risk Level for Chronic Exposure (MRL)
 - ATSDR
 - Use NOAEL plus safety factor

Minimal Risk Level - Chronic

- Designed to protect the most vulnerable groups
 - Children and pregnant women
 - Chronic illnesses

What Does Minimal Risk Level Mean ?

- Below the MRL for Daily Exposure,
 - there is no known health risk
 - for sub-chronic daily exposure

Is Your Home Safe ?

- For each chemical tested
- Compare your results to MRL
- Below the MRL, there is no known risk for a year's exposure to that chemical

Summary

- Use MRL to measure health risk
- VOCs common in our environment
 - Many household products
 - New home construction
- Don't store chemicals in living space or attached garage
- Increase ventilation