

Environmental odors

An odor is caused by a substance in the air that you can smell. Odors, or smells, can be either pleasant or unpleasant. In general, most substances that cause odors in the outdoor air are not at levels that can cause serious injury, long-term health effects, or death.

However, odors may affect your quality of life and sense of well-being. Sometimes environmental odors can affect entire communities. (Source: US Agency for Toxic Substance and Disease Registry)

Sensitive populations

Not everyone reacts to environmental odors the same way. In general, if you are young or female you may be more sensitive to odors. Non-smokers are usually more sensitive to odors than smokers. If you suffer from migraines, allergies, asthma, and other chronic lung conditions, you may feel worse when you smell unpleasant odors over a long time. (Source: US Agency for Toxic Substance and Disease Registry)

Are all environmental odors toxic?

No. In most cases, people will notice an odor well below the level in air that would cause health effects. Also, people are not equally sensitive to chemicals and may not be affected by them in the same way. Whether or not someone experiences health effects depends upon several factors, including:

- the type of chemical
- how concentrated the chemical is in the air
- how long the exposure continues, and
- whether or not the person smelling the chemical has any particular sensitivities

Health symptoms from odor exposures usually go away quickly when the odors stop. Odor is not a reliable way to determine the risk of health effects. For some chemicals, odors will be noticeable at low concentrations where the risk for health effects is also very low. For others, such as carbon monoxide, there is no odor at any concentration and no warning when people are exposed to dangerous levels. (Source: Department of Health New York, USA)

Common odors and their human detection levels

Potential odor source	Odor chemical	What it might smell like	Human detection concentration (ppm)	Human health concern concentration (ppm)
Oil refineries	Hydrogen sulfide	Rotten-egg gas	0.01-1.5 (OSHA)	50-100 (OSHA)
Petrochemical plants	Sulfur dioxide	Lighting a match-stick	0.3-1 (CDC)	5 (OSHA)
	Benzene	Paint-thinners	1.5 - 4.7 (CDC)	10 (OSHA)
Oil-fired power plants	Sulfur dioxide	Lighting a match-stick	0.3-1 (CDC)	5 (OSHA)
Vehicle exhausts				
Coastal sediments	Hydrogen sulfide	Rotten egg gas	0.01-1.5 (OSHA)	50-100 (OSHA)
Inland lakes				
Sewer systems				

CDC: US Centers for Disease Control and Prevention

OSHA: US Occupational Safety and Health Administration

How odor is reflected on KAUST AQI?

KAUST Weather provides current and up to date information on outdoor air quality in the form of Air Quality Index (AQI) as well as pollutant concentration. KAUST Weather is sourced from sensors that monitor various pollutants in the air including common odor causing gases e.g. sulfur compounds. Sulfur dioxide is one of the pollutants included on KAUST Air Quality Index. Any changes in the sulfur dioxide levels in the outdoor air is reflected on the sulfur dioxide AQI.

What KAUST is doing about it?

In the event, KAUST HSE discovers an actionable environmental odor, we conduct local area survey, consult relevant entities within and outside KAUST to identify the potential source and escalate the matter to the relevant Government authorities. In a recent example, an unpleasant burning smell was reported by KAUST community members, upon further investigation by HSE, fire in a nearby municipal waste landfill has been identified as the source of the odor. The source tracking was additionally confirmed with the support of satellite images provided by KAUST researchers. Formal complaint and correspondence was sent to the relevant government authorities.

