Safety Tip: Sensitizers

Hazard classes such as acute toxins, carcinogens, irritants, mutagens, and reproductive toxins are well known, but don't overlook the insidious nature of respiratory and skin sensitizers.

A sensitizer is a substance that can lead to an allergic response following contact. When you become sensitized to a substance, your immune system develops a memory to the specific agent. *With every subsequent exposure, it takes less of the substance to initiate the allergic reaction and the result may be more severe.*

Examples of chemical sensitizers include: allylic and benzylic halides; aromatic amines; diisocyanates; epoxy resin components; formaldehyde; nickel compounds; certain cosmetics, fragrances, and preservatives; and the catechol in poison ivy and poison oak.

In a recent case of life-threatening anaphylaxis induced by amino acid coupling agents, the sensitized researcher can no longer work in a research lab. (McKnelly, K. J.; Sokol, W.; Nowick, J. S. "Anaphylaxis Induced by Peptide Coupling Agents: Lessons Learned from Repeated Exposure to HATU, HBTU, and HCTU" *J. Org. Chem.* 2020*, 85*, 1764–1768. https://doi.org/10.1021/acs.joc.9b03280)

Bulk material sensitizers include: flour, latex rubber, metals (nickel in particular), wood dusts, and even certain fabrics.

Enzymes can be sensitizers too! In a recent case, a lipase was found to be a potent respiratory hazard. Handling of the enzyme required specialized facilities to minimize operator exposure during scaleup. (Beauchamp, T. J., et al. *Org. Process Res. Dev.* 2025*, 29*, 889. https://doi.org/10.1021/acs.oprd.4c00539)
For a review on enzyme sensitizers, see: Baur, X. "Enzymes as occupational and environmental respiratory sensitisers" *Int. Arch. Occup. Environ. Health* 2005*, 78*, 279−286. https://doi.org/10.1007/s00420-004-0590-6

The good news is that you can protect yourself from sensitizers using good lab hygiene practices, including wearing gloves, working in a fume hood, and washing your hands every time you leave the lab.