

## Guideline

**Subject: Formaldehyde in the Laboratory**  
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An important part of good laboratory management is to protect employees from exposure to hazardous chemicals which requires measures such as appropriate work practices, emergency procedures, and use of personal protective equipment.

Formaldehyde is a common chemical used as an embalming fluid, tissue preservative, sterilizer and fumigant in laboratories. It is a common sensitizing agent and can trigger an allergic reaction, including allergic alveolitis, after single or repeated exposures. There is some evidence (class 2) that long term exposure to formaldehyde by inhalation may be associated with an increased risk of cancer of the nose and accessory sinuses, nasopharyngeal and oropharyngeal cancer, haematopoietic (particularly myeloid leukemia) and lung cancer in humans.<sup>1,2</sup>

There is limited evidence that formaldehyde has any adverse effect on reproduction or development in humans. In keeping with the precautionary principle in other areas of medicine and in other occupations, exposure to formaldehyde in pregnancy should be minimized for all staff until evidence for its safety is established.

The College recommends that pathology laboratories provide up-to-date information on formaldehyde exposure in its training materials for staff. Laboratories should also have guidelines and procedures for controlling hazardous workplace chemicals including formaldehyde, encourage safe working habits and provide appropriate equipment to minimise formaldehyde overexposure.

As well as providing the best possible ventilation methods available for the individual workplace, the College recommends that air quality is monitored in areas of laboratories where formaldehyde and xylene are handled and that levels comply with the standards below. In Australia, formaldehyde and xylene monitoring are assessed against the Exposure Standards for Atmospheric Contaminants in the Occupational Environment - National Exposure Standards NOHSC: 1003 (1995) as published by Safe Work Australia.<sup>3</sup> The exposure standards represent the airborne concentration of a particular substance in the worker's breathing zone, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to nearly all workers.

The exposure standards are expressed as eight-hour time weighted average (8hr TWA). This is the average concentration over a normal eight hour working day for a five-day working week. The Safe Work Australia Exposure Standards are for formaldehyde 1 ppm, and for xylene 80 ppm, both as 8hr TWA.<sup>3</sup>

In New Zealand, formaldehyde and xylene monitoring are assessed against Workplace Exposure Standards and Biological Exposure Indices (9<sup>th</sup> Edition), developed by the Ministry of Business, Innovation and Employment. Exposure standards for formaldehyde are 0.5ppm for 8hr TWA and 0.33ppm for 12 hr TWA, with a ceiling of 1ppm. Exposure standards for xylene are 50ppm 8hr TWA.<sup>4</sup>

Other jurisdictions should check their compliance with local standards.

Useful resource:

[Material Safety Data Sheet](#)

## References

1. United States National Cancer Institute Factsheet, (2011), *Formaldehyde and Cancer Risk*, Retrieved May 7, 2018 from United States National Cancer Institute: HYPERLINK <http://www.cancer.gov/cancertopics/factsheet/Risk/formaldehyde>
2. United States Department of Labor, *Occupational Health and Safety Administration. Regulation 1910*, Retrieved May 7, 2018 from United States Department of Labor: HYPERLINK [https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=standards&p\\_id=10078](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10078).
3. Safe Work Australia, (1995), *Adopted National Exposure Standards For Atmospheric Contaminants In The Occupational Environment [NOHSC: 1003]*, Canberra, ACT, Australia.
4. Ministry of Business, Innovation and Employment, (2017), *Workplace Exposure Standards and Biological Exposure Indices*. Wellington, New Zealand.