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## Chemical and Biohazards Alert

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## Chemical and Biohazards Alert

Jack B. Kinsinger, Chairman, Chemical and Biohazards Committee

It is now understood that some chemicals have an extraordinary high potential for causing cancer in humans. Fourteen such chemicals are classified on the zero exposure tolerance list (2). The names of these fourteen chemicals are listed below:

1. N-Nitrosodimethylamine or dimethylmitrosamine
2. Bis(chloromethyl) ether
3. B-Propiolactone
4. 2-Naphthylamine
5. 2-Fluorenylacetamide
6. 4-Dimethylaminoazobenzene
7. 4-Nitrobiphenyl
8. 4-Aminobiphenyl or p-Biphenylamine
9. Benzidine
10. 3,3-Dichlorobenzidine
11. Methyl-chloromethyl ether
12. alpha Naphthylamine
13. Ethylene Imine
14. 4,4-Methylenebis(2-chloroaniline) or Bensenamine

Most of these chemical carcinogens are unlikely to be encountered in routine laboratory work. However, it is reported (1)(2) that one chemical, bis(chloromethyl) ether (BCME), can be generated if formaldehyde (or formalin) and hydrogen chloride (HCl) are brought into contact. While the amount of BCME formed in a gas or solution phase reaction of formaldehyde and HCl is small, the known carcinogenic activity of BCME at exposure levels as low as 1 ppb justifies extreme caution (3)(4)(5).

Since these two widely used chemicals are common to many laboratories, teachers responsible for laboratory supervision should take immediate and effective action to store these chemicals so that they have no possibility of reacting to form BCME. Other chemical reactions that can produce BCME include Friedel Crafts reagents ( $AlCl_3$ ,  $ZnCl_2$ , etc) with formaldehyde, paraformaldehyde or hexamethylenetetramine, or as a generality, any acidic solution of chlorine ion with formaldehyde. Extreme caution should be exercised to protect individuals should reactions of this type be performed.

## References

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