

OBJECTIVE

Determine if mixtures of gas contaminants in the work area atmosphere of kraft mills may react to generate hazardous products.

SUMMARY

- ° A review of published information showed that mixtures of chlorine and hydrogen sulphide can react to produce sulphur dichloride and sulphur monochloride, both of which are corrosive and are eye irritants. Chlorine together with methyl mercaptan in humid conditions can produce methane sulphonothioic acid methyl ester and methane sulphonyl chloride. The latter compound is also a strong eye irritant (lachrymator).
- ° Information in the literature was insufficient to assess risks to health of reactions between other potential combinations of kraft mill gases, vapours, and fumes. Laboratory experiments were done, therefore, with mixtures of chlorine and turpentine vapour, and chlorine and styrene vapour (as from fibreglass application).
- ° Chlorine reacted with turpentine vapour under ultraviolet light, simulating strong sunlight, to give products that appeared to be chlorinated terpenes. It was not possible to identify the individual compounds.
- ° Chlorine and styrene vapour reacted under ultraviolet light to give products tentatively identified by gas chromatography-mass spectrometry (GC-MS) as chlorinated styrenes, dichloroethylbenzene, and chloroacetophenone. The last named compound is a known eye irritant.

- ° Similar reactions may occur with different ratios of chlorine and organic vapours in the absence of ultraviolet light.
- ° Recommendations are made to help reduce the risk of adverse effects from unexpected reactions between these gases and vapours in kraft mills.