









Ethanal and higher aldehydes

including propanal, butanal

Substance	Hazard	Comment
Ethanal (acetaldehyde) <i>Liquid</i> with boiling point close to room temperature (21 °C)	  FLAMM. IRRITANT  HEALTH HAZARD	DANGER: extremely flammable liquid and vapour; causes serious eye irritation; may cause respiratory irritation; suspected of causing cancer. For a 15-minute exposure, the concentration in the atmosphere should not exceed 92 mg m ⁻³ . The flash point is -39°C, ie the liquid gives off sufficient vapour at -39°C to ignite if a flame or spark is applied. May boil spontaneously during storage or on opening. May spurt out of the bottle as the pressure is released when it is opened. Tiny traces of impurity can cause spontaneous boiling. Cool in an ice bath before opening in a fume cupboard.
Ethanal tetramer (metaldehyde, 2,4,6,8-tetramethyl-1,3,5,7-tetraoxacyclooctane) <i>Solid</i>	  FLAMM. HARMFUL	WARNING: flammable solid; harmful if swallowed. Sometimes used as solid fuel for model steam engines but it may spit as it burns. Hexamethylene is possibly safer.
Propanal (propionaldehyde) <i>Liquid</i>	  FLAMM. HARMFUL	DANGER: highly flammable liquid and vapour; causes skin and serious eye irritation; may cause respiratory irritation. The flash point is -30°C, ie the liquid gives off sufficient vapour at -30°C to ignite if a flame or spark is applied. Because of its higher boiling point (48 °C), it is much safer to use than ethanal.
Butanal (butyraldehyde) <i>Liquid</i>	 FLAMMABLE	DANGER: highly flammable liquid and vapour. The flash point is -22°C, ie the liquid gives off sufficient vapour at -22°C to ignite if a flame or spark is applied. Because of its higher boiling (75 °C), it is much safer to use than ethanal.

Typical control measures to reduce risk

- Wear eye protection and protective gloves (preferably nitrile).
- Open ethanal bottles very cautiously in a fume cupboard, after cooling in an ice bath.
- Avoid using ethanal if at all possible; use propanal or butanal instead.
- **Do not use near naked flames; if heating is necessary, use an electrically-heated water bath or hot water from a kettle.**

Assessing the risks

- **What are the details of the activity to be undertaken? What are the hazards?**
- **What is the chance of something going wrong?**
- **How serious would it be if something did go wrong?**
- **How can the risk(s) be controlled for this activity?**
eg, can it be done safely? Does the procedure need to be altered? Should goggles or safety spectacles be worn?

Emergency action

- **In the eye** Immediately flood the eye with gently-running tap water for 10 minutes. Consult a medic.
- **Vapour breathed in** Remove the casualty to fresh air. Keep him/her warm. Consult a medic if breathing is difficult.
- **Swallowed** Do no more than wash out the mouth with water. Do **not** induce vomiting. Consult a medic.
- **Spilt on the skin/clothing** Remove contaminated clothing. Wash the affected area and clothing with plenty of water.
- **Spilt on the floor, bench, etc** Put out all Bunsen flames. Wipe up small amounts with a cloth and rinse well. For larger amounts, open windows, if fumes are not too strong cover with mineral absorbent (eg, cat litter), scoop into a bucket and add water.