Higher alcohols

including **propanol, butanol** *and* **pentanol**

Substance	Hazard	Comment
Propan-1-ol (*n*-propanol) **Propan-2-ol** (*iso*-propanol) *Liquids*	FLAMMABLE IRRITANT CORROSIVE	DANGER: highly flammable liquid and vapour; may cause drowsiness or dizziness; causes serious eye damage (**propan-1-ol**)/irritation (**propan-2-ol**). For a 15-minute exposure, the concentration of vapour in the atmosphere should not exceed 625 mg m^{-3} (**propan-1-ol**), 1250 mg m^{-3} (**propan-2-ol**). The liquid gives off sufficient vapour at 22°C (**propan-1-ol**)/12°C (**propan-2-ol**) to ignite if a flame or spark is applied. **Propan-2-ol** is sometimes used as 'rubbing alcohol', especially in the USA. Also used to clean optical surfaces, eg spectacle and camera lenses.
Butan-1-ol (*n*-butanol) **2-methylpropan-1-ol** (*iso*-butanol) *Liquids*	FLAMMABLE IRRITANT CORROSIVE	DANGER: flammable liquid and vapour; causes skin irritation and serious eye damage; may cause respiratory irritation and drowsiness or dizziness; **butan-1-ol** is harmful if swallowed. For a 15-minute exposure, the concentration of vapour in the atmosphere should not exceed 154 mg m^{-3} (**butan-1-ol**), 231 mg m^{-3} (**2-methylpropan-1-ol**). The flash point of **butan-1-ol** is 37°C (**2-methylpropan-1-ol,** 28°C), ie the liquid gives off sufficient vapour at 37°C/28°C to ignite if a flame or spark is applied.
2-methylpropan-2-ol (*tert*-butyl alcohol) Liquid but may be solid on cold day	FLAMMABLE IRRITANT	DANGER: highly flammable liquid and vapour; causes serious eye irritation; harmful if inhaled; may cause respiratory irritation. For a 15-minute exposure, the concentration of vapour in the atmosphere should not exceed 462 mg m^{-3}. Liquid gives off sufficient vapour at 11°C to ignite if a flame or spark is applied.
Butan-2-ol (*sec*-butyl alcohol) *Liquid*	FLAMMABLE IRRITANT	WARNING: flammable liquid and vapour; causes serious eye irritation; may cause respiratory irritation and drowsiness or dizziness. For a 15-minute exposure, the concentration of vapour in the atmosphere should not exceed 462 mg m^{-3}. The flash point is 24°C, ie the liquid gives off sufficient vapour at 24°C to ignite if a flame or spark is applied.
Pentan-1-ol (*n*-amyl alcohol) **3-methylbutan-1-ol** (*iso*-amyl alcohol) *Liquids*	FLAMMABLE IRRITANT	WARNING: flammable liquid and vapour; may cause skin, respiratory and serious eye irritation; may be harmful if swallowed. For a 15-minute exposure, the concentration of **3-methylbutan-1-ol** in the atmosphere should not exceed 458 mg m^{-3}.

Typical control measures to reduce risk

- Wear eye protection.
- Make sure the room is well ventilated or, in a laboratory, use a fume cupboard if possible.
- Check availability of ways of putting out any fires.
- **Do not use near naked flames; if heating is necessary, use an electrically-heated water bath or hot water from kettle.**
- **NEVER** boil or distil organic liquids to dryness. Some, such as propan-2-ol and other secondary alcohols, present a remote explosion risk due to the presence of peroxides.

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?
  eg does alcohol need to be heated? Could there be high levels of vapour?
- 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 all emergency situations, alert the responsible adult immediately. Be aware that actions may include the following:

- In the eye — Irrigate the eye with gently-running tap water for at least 20 minutes. Call 999/111.
- Vapour breathed in — Remove the casualty to fresh air. Keep them warm. Call 999/111 if breathing is difficult.
- In the mouth swallowed — Do no more than rinse and spit with drinking water. Do **not** induce vomiting. Call 999/111
- Clothing catches fire — Smother flames on clothing or the skin with a fire blanket or other material. Cool any burnt skin with gently-running tap water for 20 minutes. Call 999/111 if the area of burn is larger than a small coin.
- Other fires — Allow fires in sinks etc to burn out. Fires at the top of test tubes, beakers, etc should be smothered with a damp cloth or heat-resistant mat.
- Spilt on the skin or clothing — Remove contaminated clothing. If more than a test tube amount was involved, wash the affected area and clothing with plenty of water.
- Spilt on the floor, bench, etc — Put out Bunsen flames. Wipe up small amounts with cloth and rinse it well. For larger amounts, open windows, cover with mineral absorbent (eg, cat litter), scoop into a bucket and add water.

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