








Hydrocarbons (2011)

Substance	Hazard	Comment
Methane (natural gas); ethane; propane (Calor gas, camping gas); butane (lighter fuel)	 EXTREMELY FLAMMABLE	These gases form explosive mixtures with air and oxygen. Mixtures with air between 6% and 12% methane by volume are explosive. Such mixtures may ignite below 650 °C. Butane is easily liquefied under pressure (it normally boils at 0 °C) and is denser than air.
Pentane, hexane, heptane, etc; petroleum ethers 40-60 or 60-80; cyclohexane, cyclohexene; petrol (gasoline) (but see also benzene, below); methylbenzene (toluene); dimethylbenzene (xylene).	 HIGHLY FLAMMABLE  HARMFUL / IRRITANT	Hexane and mixtures containing hexane (eg petroleum ether 40-60) are harmful to health by prolonged exposure. For long-term exposure, concentration should not exceed 72 mg m ⁻³ . Cyclohexene and dimethylbenzene are irritating to eyes, skin, lungs; the others are mostly harmful if breathed in.
Benzene and products containing more than 0.1% benzene	 TOXIC  HIGHLY FLAMMABLE	Benzene causes cancer. There is a serious danger to health from breathing it in or from skin contact over the long term, or from swallowing it. Use of benzene or products containing more than 0.1% benzene is banned in all educational laboratories. This includes unleaded petrol, which contains several % benzene.
Paraffin (kerosine); diesel fuel; engine oil	 HARMFUL	Some oils may contain substances which cause cancer. After oil has been used in car engines, some parts may have broken down into more hazardous products.
Naphthalene	 HARMFUL	Harmful if breathed in, swallowed or in contact with skin. Used in moth balls. If heated, the concentration of vapour in the air increases considerably.
Waxes including paraffin wax; medicinal paraffin ('liquid paraffin'), oil for oil baths	LOW HAZARD	For example, candle wax.

Typical control measures to reduce risk

- Use smallest amount possible; wear eye protection; avoid skin contact; make sure room is well ventilated.
- Use fume cupboard or prevent escape of vapour, eg with mineral wool plug in test tube.
- Check gas supplies for leaks; store bottled gas in a cool place; use "spirit burners" with care.
- Check equipment to put out fires, eg damp cloth, bench mat, fire blanket.
- **Do not use the highly flammable liquids 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?*
Eg, Does hydrocarbon need to be heated? Could quantities of the vapour be breathed in?
- *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 eye** Flood eye with gently-running tap water for 10 minutes. See doctor.
- **Swallowed** Wash out mouth. Give glass of water to drink. Do NOT make victim vomit. See doctor.
- **Spilt on skin or clothing** Remove contaminated clothing. Wash affected area and clothing with plenty of water.
- **Clothing catches fire** Smother flames on clothing or skin with fire blanket or other material. Cool any burnt skin with gently-running tap water for 10 minutes.
- **Other fires** Allow fires in sinks, etc to burn out. Fires at top of test tubes, beakers, etc should be smothered with damp cloth or heat-proof mat.
- **Spilt on floor, bench, etc** Put out all Bunsen burner flames. Wipe up small amounts with cloth. Rinse well. For larger amounts open windows, cover with mineral absorbent (eg, cat litter), scoop into bucket and add water.