

## General Information

Nicotine is an extremely powerful drug which causes addiction in similar ways to drugs like heroin and cocaine. Just 60mg of pure nicotine placed on the tongue would kill a person within minutes. Nicotine is contained in the moisture of the tobacco leaf. When the cigarette is lit, the nicotine evaporates, attaching itself to minute droplets in the tobacco smoke inhaled by the smoker. The body absorbs it very quickly, reaching the brain within about seven seconds. It stimulates the central nervous system, increasing the heart beat rate and blood pressure, leading to the heart needing more oxygen.

Carbon monoxide, the main poisonous gas in car exhausts, is also present in cigarette smoke. It binds to haemoglobin much more readily than oxygen, preventing the blood from carrying as much oxygen as it should. Smokers may have the oxygen carrying power of their blood cut by as much as 15%.

Tar describes the particulate material inhaled when the smoker draws on a lighted cigarette. Each particle is composed of a large variety of organic and inorganic chemicals. In its condensed form, tar is the sticky brown substance, which can stain smokers' fingers and teeth yellow-brown. All cigarettes produce tar but the brands differ in amounts. The average tar yield of British cigarettes has declined. In the UK cigarette packets must now carry an accurate statement of both the tar and the nicotine yield per cigarette on the packet itself. An upper limit of 12mg of tar per cigarette applies to all cigarettes sold in the EU with the exception of Greece which was granted an extension until 2006.

**Other Chemicals**      **Tobacco smoke includes over 4,000 substances. Some have marked irritant properties and some 60 have been shown to cause cancer. The properties of some of these substances are described below.**

Acrolein                      Highly toxic if swallowed and by inhalation. May cause corneal injury, severe eye irritation or burns to the eye. Human mutagenic data. May be a reproductive hazard. Poisonous at low ppm concentrations. Lachrymator.

Ammonia                      Irritant and corrosive to skin, eye, respiratory tract and mucous membranes. May cause severe burns, eye and lung injuries. Skin and respiratory related diseases aggravated by exposure.

Benzene                      This material is a known carcinogen. The risks of using it in the laboratory must be fully assessed before work begins. Short-term exposure may cause a variety of effects, including nausea, vomiting, dizziness, narcosis, reduction in blood pressure, central nervous system depression. Skin contact may lead to dermatitis. Long-term exposure may lead to irreversible effects. Severe eye irritant. Skin and respiratory irritant.

Benzo(a)pyrene,              Poison. A probable carcinogen in humans and a known human mutagen. It is believed to cause bladder, skin and lung cancer. Exposure to it may damage the developing foetus. May cause reproductive damage. May be transferred to nursing infants through mother's milk. Skin, respiratory and eye irritant. May cause changes to the colour and properties of skin. Exposure to sunlight can increase the skin damage caused by this chemical.

Carbon monoxide	Toxic by inhalation. Odourless and colourless, so no indication exists of its presence in a room. May impair fertility or cause harm to the unborn child. Delayed adverse effects possible.
Dimethylnitrosamine	Extremely poisonous if swallowed, inhaled or absorbed through the skin. Experimental neoplastigen, carcinogen, tumorigen, teratogen. Transplacental carcinogen. Transplacental teratogen—causes foetal abnormalities. May cause fatal liver disease. Probable human carcinogen.
Formaldehyde	Causes burns. Very toxic by inhalation, ingestion and through skin absorption. Readily absorbed through skin. Probable human carcinogen. Mutagen. May cause damage to kidneys. May cause allergic reactions. May cause sensitisation. May cause heritable genetic damage. Lachrymator. Very destructive of mucous membranes and upper respiratory tract, eyes and skin.
Formic acid	Corrosive, causes severe burns. Harmful by inhalation, ingestion and through skin absorption. Readily absorbed through skin. Very destructive of mucous membranes and upper respiratory tract, eyes and skin. Severe eye irritant. Inhalation may be fatal.
Hydrogen cyanide	Very toxic by inhalation, ingestion and through skin contact. Inhalation, ingestion or skin contact may be fatal.
Hydrazine	Harmful if inhaled or swallowed. Poison. Probable human carcinogen. Readily absorbed through the skin. May cause severe skin and eye irritation or burns. Long-term exposure may damage central nervous system, lungs, blood, liver and kidney damage.
Methyl Chloride	Toxic by inhalation. Gas is readily absorbed, but very slowly removed from the body. Irritant. Mutagen. Possible carcinogen. Human mutagenic data. May cause systemic effects. Possible teratogen. Can be absorbed through the skin.
Nicotine	Poison—may be fatal if inhaled, swallowed or absorbed through the skin. Readily absorbed through the skin.
Nitrosodimethylamine	Extremely poisonous if swallowed, inhaled or absorbed through the skin. Experimental neoplastigen, carcinogen, tumorigen, teratogen. Transplacental carcinogen. Transplacental teratogen. May cause fatal liver disease. Probable human carcinogen.
Phenol	This material is a systemic poison and constitutes a serious health hazard. The risks of using it in the laboratory must be fully assessed before work begins. Vesicant. Acute poisoning by ingestion, inhalation or skin contact may lead to death. Phenol is readily absorbed through the skin. Highly toxic by inhalation. Causes burns.
Quinolene	Laboratory experiments have shown mutagenic effects. Possible carcinogen. Severe eye irritant. Toxic by inhalation, ingestion and through skin contact.
Toluene	Toxic by inhalation, ingestion or by absorption through skin. Serious irritant. Experimental teratogen.