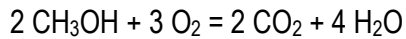


## Methanol - Technical

### History

Methanol also known as methyl alcohol, carbinol, wood alcohol or wood spirits, is a chemical compound with chemical formula CH<sub>3</sub>OH. It is the simplest alcohol and is a light, volatile, colourless, flammable, liquid with a distinctive odour somewhat milder and sweeter than ethanol (ethyl alcohol). It is toxic to humans as are petrol and diesel.

Methanol burns in air forming carbon dioxide and water:



Methanol is often called wood alcohol because it was once produced chiefly as a by-product of the destructive distillation of wood. It is now mainly produced by a multi-step process from natural gas and can be produced renewably very efficiently from biomass gasification and from landfill and Anaerobic Digester (AD) methane rich gases.

It is widely used already as an antifreeze, solvent, fuel and as a denaturant for ethyl alcohol.

Methanol is produced naturally in the anaerobic metabolism of many varieties of bacteria. As a result, there is a small fraction of natural methanol vapour in the atmosphere. Over the course of several days, natural atmospheric methanol is oxidized by oxygen with the help of sunlight to carbon dioxide and water.

### Making Methanol from natural gases

Whether it is made from the methane in natural gas, or from the methane in renewable gases, the process, which transforms the methane to methanol, is the virtually the same. The natural methane molecule is reformed with steam in a furnace to produce hydrogen and carbon monoxide. This gas mixture is known as "synthesis gas". The hydrogen and carbon monoxide gases are then reacted under pressure in the presence of a synthesising catalyst to form the methanol. The first reforming step is endothermic, absorbing energy, the second synthesis step is exothermic releasing energy.

Today, synthesis gas is most commonly produced from the methane component in natural gas. Three processes are commercially practiced. At moderate pressures of 1 to 2 MPa (10–20 atm) and high temperatures (around 850 °C), methane reacts with steam on a nickel catalyst to produce syngas.

Although natural gas is the most economical and widely used feedstock for methanol production, other feedstocks can be used. Where natural gas is unavailable, light petroleum products can be used in its place. The South African firm Sasol also produces methanol using synthesis gas from coal.