

# Methylated Spirits

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Methylated spirits ("metho") is a mixture of ethyl alcohol (95%) and methyl alcohol (5%). The methyl alcohol is poisonous and is added to prevent the methylated spirits being used as cheap drinking alcohol.

## Ethyl alcohol

Ethyl alcohol, or ethanol, is produced by the fermentation of sugars, or from direct synthesis from ethylene. It is a renewable energy source.

Ethanol's formula is  $C_2H_5OH$ . Its boiling point is 78.5 deg C, and its melting point is -117.3 deg C.

Ethanol burns with a hot, pale-blue flame. It is miscible with water. Uses include consumption in alcoholic beverages, a solvent, an anti-freeze solution, and a fuel. Ethanol is used as an additive to car fuel and is burnt with liquid oxygen in some rocket engines. When Ethanol is burnt in air, the results of combustion are carbon dioxide and water.

## Methyl alcohol

Methyl alcohol, or methanol, is also sometimes called wood spirit. It is produced by the destructive distillation of wood, or by a synthetic process which involves reacting carbon monoxide with hydrogen gas.

Methanol's formula is  $CH_3OH$ . Its boiling point is 64.6 deg C, and its melting point is -97 deg C.

Methanol burns with a pale, non-luminous flame. It is poisonous and, if consumed, causes blindness, insanity, and eventual death. It is commonly used as a denaturant for ethyl alcohol, and is miscible with water.

## Methylated spirits as a fuel

The energy released from burning ethanol is approximately 30 kJ/g. For comparison, the energy released during the combustion of propane and butane are about 50 kJ/g and 49 kJ/g respectively.

It is simple to use metho as a cooking fuel - simply place about 30 ml in a small metal container and light it. If you support a cooking pot over the flame, you can boil a litre of water in about 16 minutes - no special equipment required! I tried a stainless steel egg cup and it worked fine.

More efficient metho burners have a series of small holes which act as jets that the metho burns from. Such burners can boil a litre of water in about 8 or 9 minutes.

## Safety precautions with metho

Although relatively safe compared to other stove fuels, metho is a flammable and toxic substance which needs to be handled carefully. Here are a couple of safety hints:

- Do not refill a metho burner until it is cool enough to touch. This is to avoid accidentally igniting the

fuel bottle.

- Do not store metho in a container which you later intend to use to hold drinking water - you will not be able to get rid of the foul taste! It is best to store it in a properly labelled fuel container such as a Nalgene fuel bottle.
- If you get metho on your hands, rinse them thoroughly before handling food.

## Names for methylated spirits around the world

In the UK, Australia, and New Zealand, metho is called methylated spirits. In the US it is called denatured alcohol. In Europe, it may be called spirits, brennsprits (Germany), alcool a bruler (France), or alcool etilico denaturato (Italy). It is generally available in hardware stores, supermarkets, service stations, and camping/outdoors stores. Methylated spirits may not be available in some countries due to alcohol restrictions (e.g. Pakistan).

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