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### 19<sup>th</sup>-Century Wood Alcohol Emerges as an Alternative Fuel Source for the 21<sup>st</sup> Century

#### Historical perspective

Methanol (CH<sub>3</sub>OH) is a clear and colourless liquid that is also known as methyl alcohol or *wood alcohol*, since it was first derived from wood sources. The idea of extracting alcohol from wood as an energy source (by subjecting it to hydrolysis and fermentation) is actually quite old. As early as 1819, French scientists were publishing papers on the topic. However, large-scale industrial production of wood alcohol was first accomplished in the United States in 1910, using pine sawdust and sulphuric acid heated by steam, with the extract (turpentine) treated with fermentation processes to recover alcohol.

In France, the manufacture of alcohol from sawdust was studied and implemented industrially in a distillery in the Ardèche region around 1914. During the First World War, there was increasing interest in wood alcohol as a new energy source to power vehicles, provide lighting for lamps and meet other energy requirements for national defence. Some historians suggest that the proliferation of alcohol stills during this period may have prolonged the war, since in Germany thousands of engines were converted to run on alcohol.

These early attempts to manufacture wood alcohol in both Europe and America were hampered by difficulties with corrosion (due to the acids) and the vast amounts of wood products or sawdust required to produce commercially viable amounts of alcohol.

#### Modern methanol production

Today, methanol is produced on an industrial scale using natural gas as the principal feedstock. In the first step of the process, called reforming, natural gas and steam are mixed together and passed over a nickel catalyst inside long thin alloy tubes that are heated to temperatures of over 800 degrees Celsius. The resulting synthesis gas consists of hydrogen, carbon monoxide and carbon dioxide.

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## **How methanol is made – page two**

The next steps are compression and synthesis. The synthesis gas is compressed and passed over a copper catalyst, producing heat. After cooling, a crude form of methanol (comprised of 82 per cent methanol and 18 per cent water) is produced. Crude methanol also contains small quantities of other impurities, such as ethanol and dissolved gases.

Crude methanol is purified in a final stage called distillation. Water and impurities are removed in distillation columns, leaving the remaining methanol 99.85 per cent pure.

## **Modern uses of methanol**

Methanex sells its product to many of the world's leading chemical manufacturers who turn methanol into other industrial chemicals, such as formaldehyde and acetic acid, that are used to make a countless array of synthetic products for home and industry. Methanol is used to produce a variety of everyday products, including windshield washer fluid, plastic bottles, paints, polyester, CDs and DVDs, and health care and pharmaceutical products.

As the global economy grows, so does the importance of methanol as an alternative fuel and energy resource in growing applications such as dimethyl ether, direct gasoline blending and biodiesel. Finding new fuels and energy alternatives is essential for global energy security. Methanol is becoming part of the world's energy mix – an alternative fuel with powerful applications.

## **Who we are**

Methanex is a Vancouver-based, publicly traded company engaged in the worldwide production, distribution and marketing of methanol. Methanex shares are listed for trading on the Toronto Stock Exchange in Canada under the trading symbol "MX", on the NASDAQ Global Market in the United States under the trading symbol "MEOH" and on the foreign securities market of the Santiago Stock Exchange in Chile under the trading symbol "Methanex". Methanex can be visited online at [www.methanex.com](http://www.methanex.com).

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