UNIVERSITY OF MINNESOTA
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Syngas from Autothermal Reforming of Ethanol

IP Status: Issued US Patent; **Application #:** 10/676,324

Autothermal Reforming of Ethanol and Alcohols into Syngas

Ethanol and alcohols can be converted into syngas using a robust autothermal reforming process. Syngas is a mixture of carbon monoxide and hydrogen that can be used to synthesize other chemicals or directly as a fuel. The recent advancements in fuel cell technology have spurred an interest in converting alcohols into hydrogen rich gas streams. This robust method enables the conversion of a nontoxic liquid such as an ethanol-water mixture into hydrogen to power fuel cells. The hydrogen is produced by partial oxidation, which requires less heat and occurs more rapidly than the process of steam reforming. Unlike most conversion methods, this process is completely, autothermal and does not require energy input to convert the gas. The conversion is quick and efficient, taking less than 10 milliseconds to complete.

MN-IP Try and Buy

Try

- Trial fee is $5,000 for a six month license

Buy

- $30,000 conversion fee (TRY to BUY)
- No patent costs
- Royalty rate of 3% (2% for MN company)
- Royalty free for first $1M in sales

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Ethanol as a Fossil Fuel Alternative

The autothermal reforming process produces hydrogen from ethanol and other alcohols. Ethanol is easy to transport and nontoxic. Ethanol is also less expensive than fossil fuels. This process is different from ordinary combustion methods, which burn ethanol to produce water and carbon dioxide. Because the process does not produce carbon dioxide, it does not contribute to greenhouse gas emissions. The reactor feeds hydrogen into fuel cells, where it will be burned to produce energy. Fuel cells are an efficient energy source and generate 3x more power than car engines.

FEATURES OF AUTOTHERMAL REFORMING OF ETHANOL AND ALCOHOLS INTO SYNGAS:

- Rapid Reaction--takes less than 10 milliseconds to complete the conversion
- Less Expensive--ethanol is a fossil fuel alternative and is less expensive
- Autothermal reforming process--requires no energy input
- Nontoxic--does not burn ethanol like ordinary combustion

Technology ID
z03038

Category
Engineering & Physical Sciences/Chemicals
Engineering & Physical Sciences/Sustainable Technology

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