

## Separation process for one-step production of dimethyl ether from synthesis gas

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In the one-step syngas-to-DME process, syngas is converted in a single reactor to methanol and DME. This can reduce the cost in the syngas conversion part of the process, and possibly lead to a more economic process for DME production than the traditional two-step process, namely, methanol synthesis followed by methanol dehydration in two separate reactors. However the downstream separation for the one-step process could be costly because of the high volatility of two reaction products, DME and CO<sub>2</sub>. This study investigated several separation processes and determined the most economical separation scheme for one-step dimethyl ether (DME) synthesis.