PRODUCTION OF FORMALDEHYDE FROM METHANOL

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Background:

Formaldehyde is prepared by the synthesis of **Methanol**(**CH3OH**)**vap**. Methanol is converted into formaldehyde by catalytic vapor phase oxidation over a metal oxide catalyst. In one variation of the process methanol is vaporized, mixed with air, and then passed over the catalyst at 300–600 °C. The formaldehyde produced is absorbed in water and then fed to a fractionating column. Formaldehyde is compound that is ubiquitous in the environment. It is a gaseous contaminant of emissions from power plants, manufacturing sites, and automobiles.

$CH_3OH \rightarrow CH_2O + H_2$ $\Delta H = 84$ kJ/mol

Description of the Flowsheet:

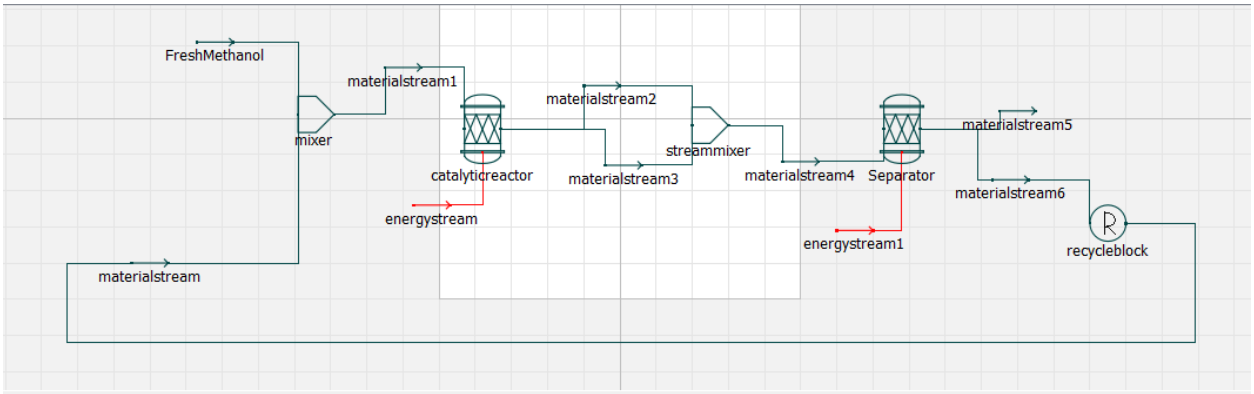
Methanol is entering to the conversion reactor with the temperature of 250C and the mass flow is **1600 kg/h** with pressure of **1 bar**. The conversion reactor gives two output the **MSTR-06** gives Formaldehyde and hydrogen in high amount compare to methanol but **MSTR-07** gives more than **90%** is methanol and the both MSTR-06 and **MSTR-07** are comes from catalytic reactor

The two outputs are connected to the Steam mixer and the with the property package of **Roult's Law**, and the output is **MSTR-08** which has **37%** of both Formaldehyde and Hydrogen. The methnol has **24%** of value the overall value of the methanol reactant and passes with the same mass flow with different molar flow.

The **MSTR-08** is connected to the **compound sepeator** and it seperates the Formaldehyde and Hydrogen. The another output is Methanol Recovered from the reaction happend it can be reused by the **Recycle Block** and that is connected to the **MSTR-11** it has going throgh the mixer and the another line is connected from the **Specification Block** It is comes from the Formaldehyde and hydrogen outlet in that the samll amount of methanol is present and the mixer is goes to the **Methanol Entering** Block with this the methanol is recovered.

Flowsheet:

Production Of Formaldehyde Flowsheet By Using Methanol



Conclusion:

Thus, OpenModelica is used to simulate the Production of Formaldehyde from Methanol.