

METHANOL TO AROMATICS

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OVERVIEW

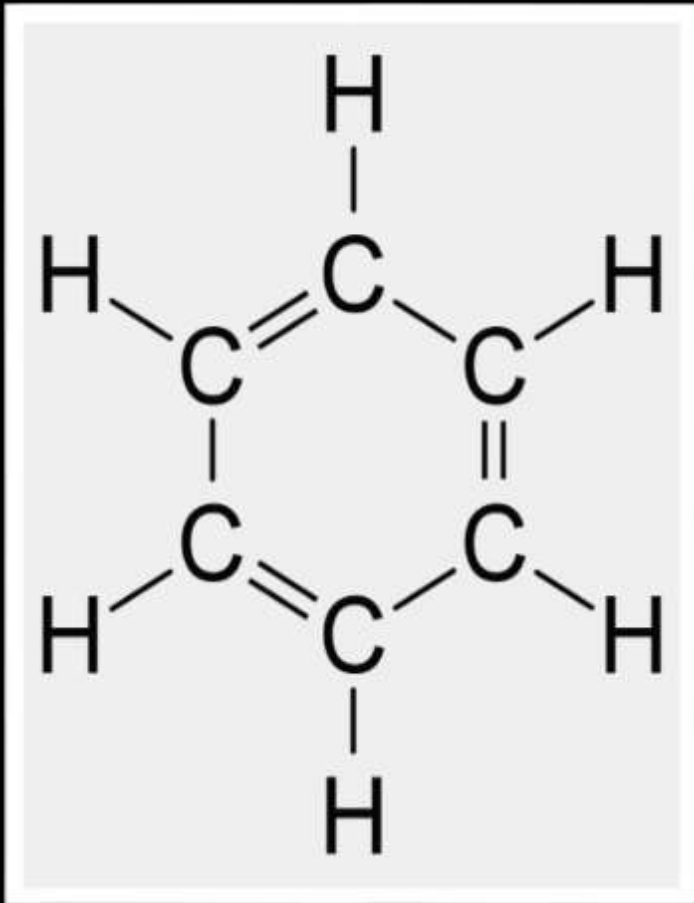
- Project Overview
 - Methanol to Aromatic Products
 - Specialized Catalyst
 - One Reactor and Multiple Separator Design
- Specific Contributions
 - Environment Concerns
 - Global Awareness
 - Project Recommendations

METHANOL

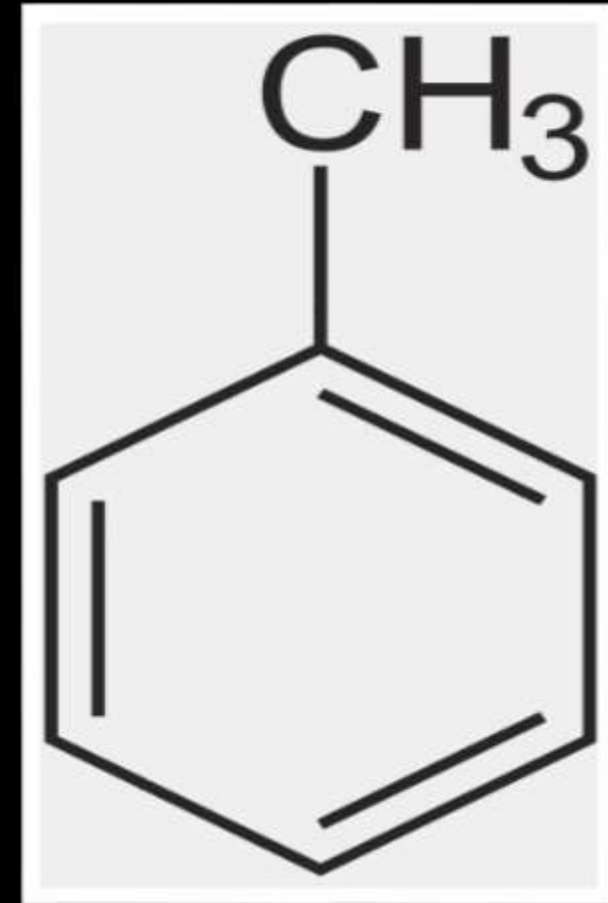
- Chemical Formula- CH_3OH
- Price- \$0.14/ lb
- Sensitivity



BENZENE & TOLUENE

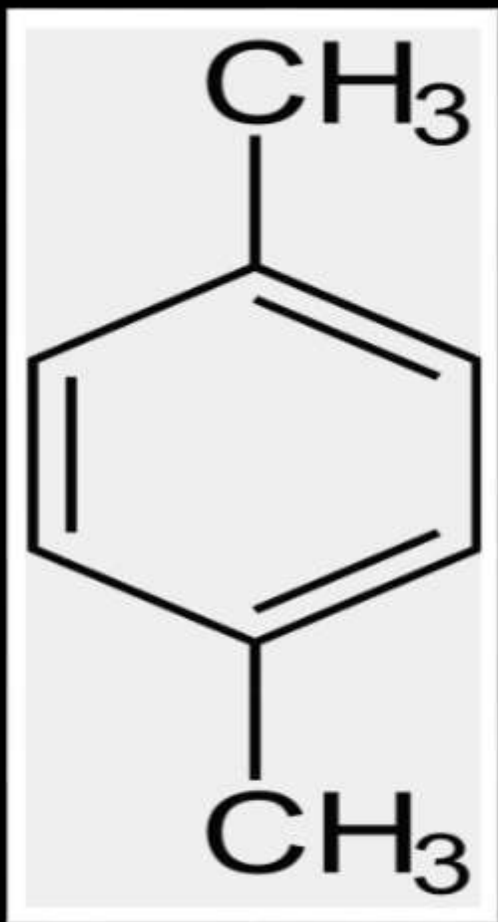


Benzene

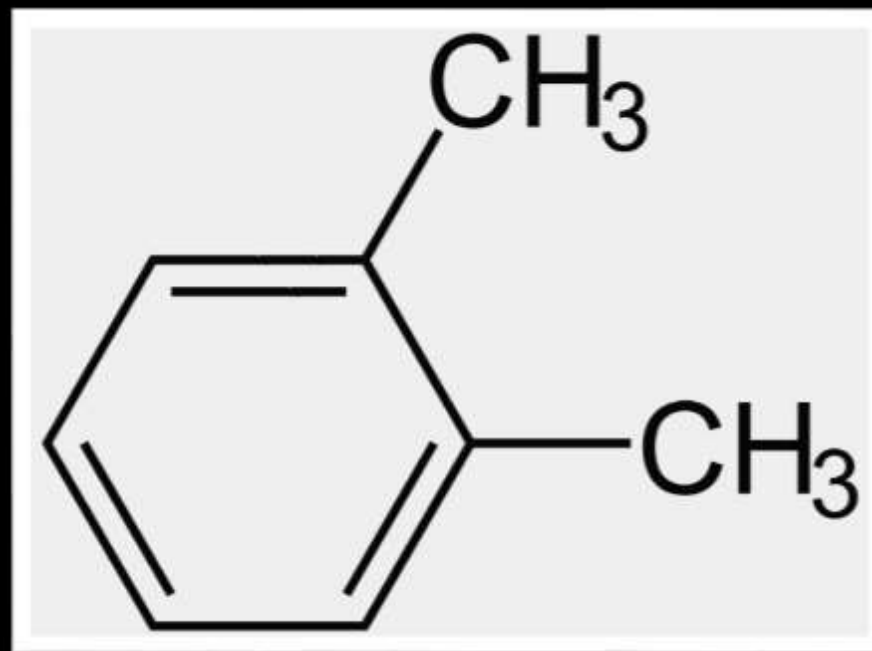


Toluene

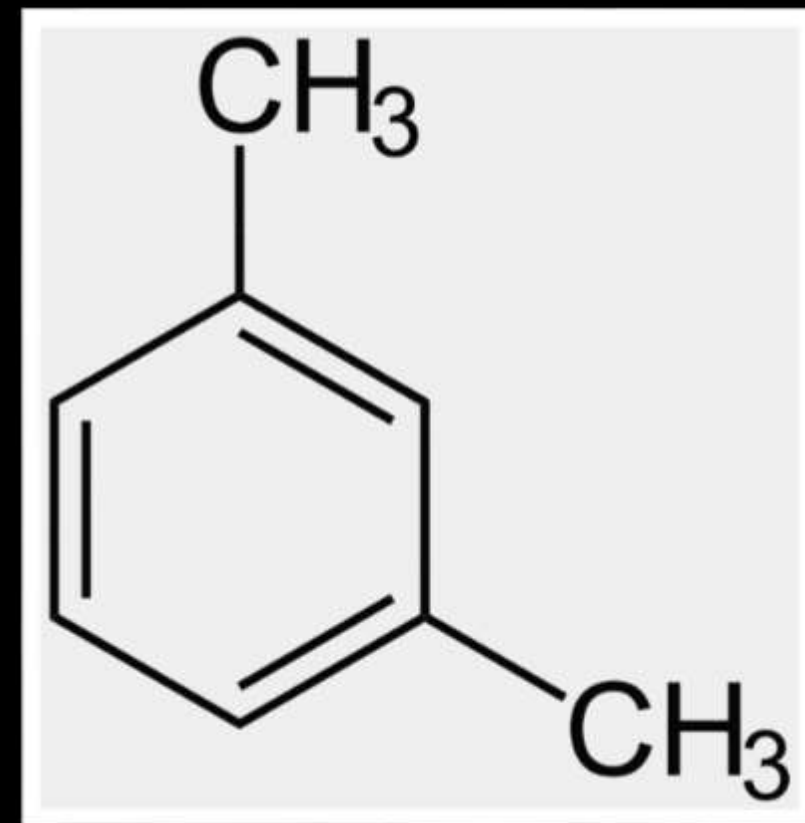
XYLENE'S



Para-Xylene



Ortho-Xylene



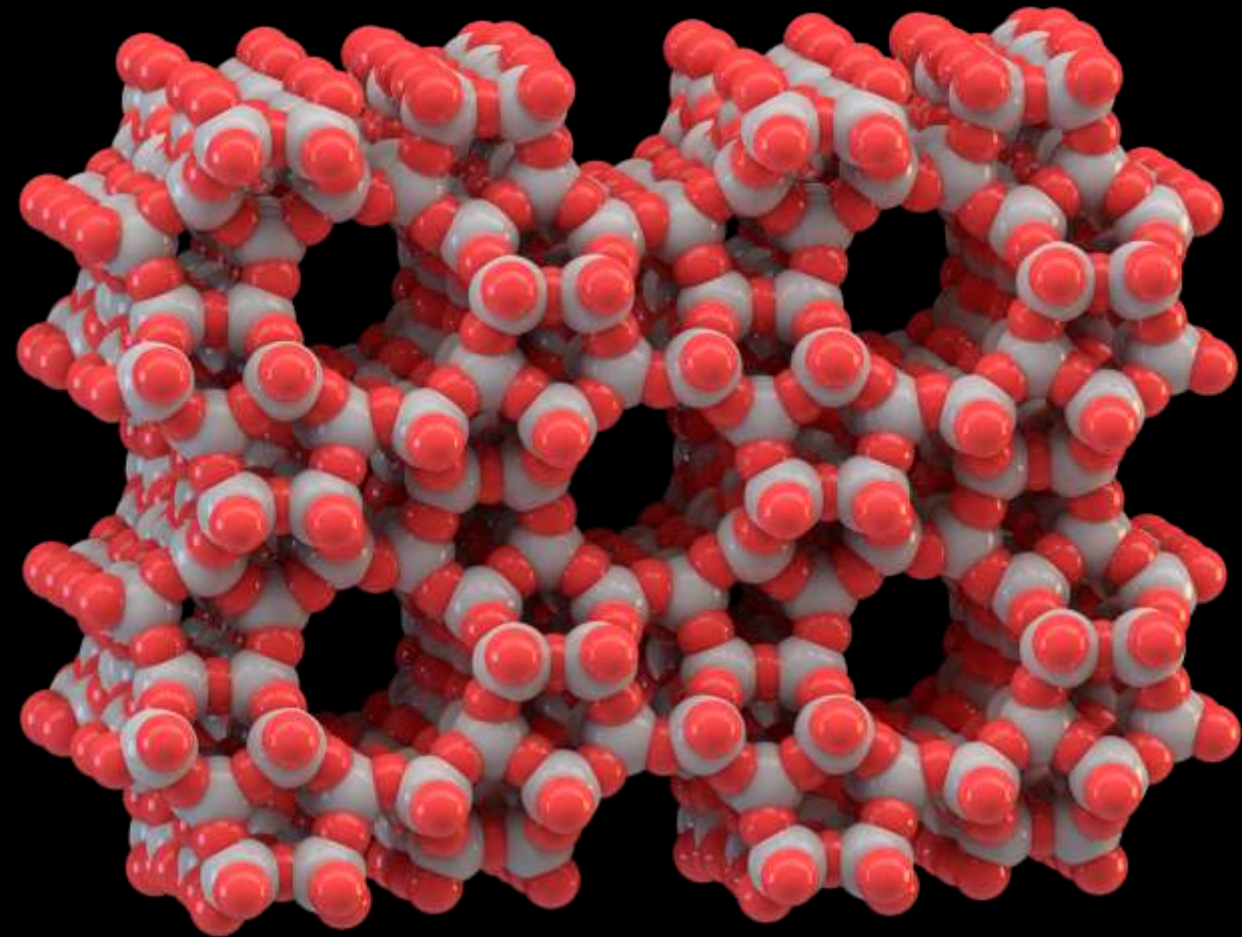
Meta-Xylene

XYLENE'S

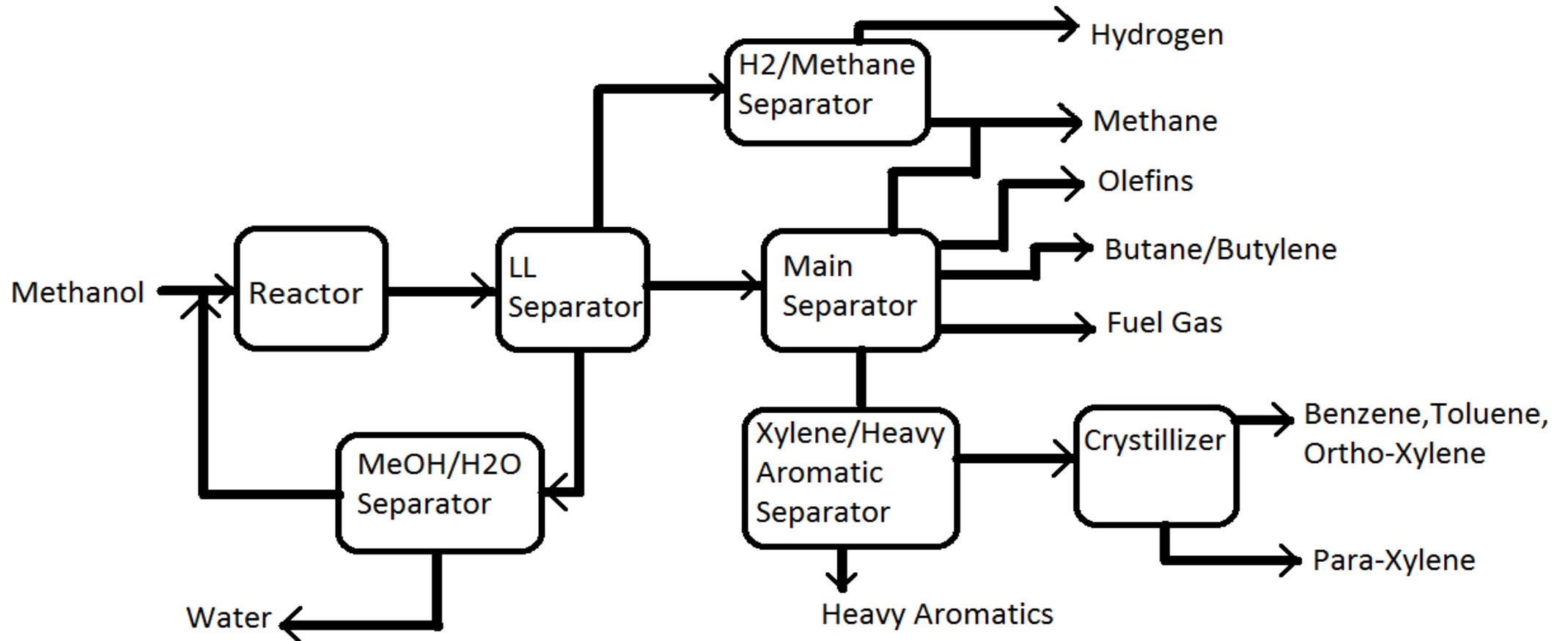
- Para-Xylene and Ortho-Xylene
- Other Processes Meta-Xylene Dominated
- Order of Value
 - Para-Xylene
 - Ortho-Xylene
 - Meta-Xylene

CATALYST

- ZSM-5 (Zeolite Socony Mobil-5)
- Zeolite Catalyst with Silver Ion Impregnation



PROCESS BLOCK DIAGRAM



ENVIRONMENTAL CONCERNS

- Water Emissions from Methanol/Water Separator
- Air Emissions from Furnace

Contaminant	MCLG (mg/L)	MCL or TT (mg/L)	Potential Health Effects from Long-Term Exposure Above the MCL
<u>Benzene</u>	zero	0.005	Anemia; decrease in blood platelets; increased risk of cancer
<u>Ethylbenzene</u>	0.7	0.7	Liver or kidneys problems
<u>Toluene</u>	1	1	Nervous system, kidney, or liver problems
<u>Xylenes (total)</u>	10	10	Nervous system damage

CAS Number	Chemical Name
71432	Benzene (including benzene from gasoline)
100414	Ethyl benzene
110543	Hexane
67561	Methanol
91203	Naphthalene
108883	Toluene
1330207	Xylenes (isomers and mixture)
95476	o-Xylenes
108383	m-Xylenes
106423	p-Xylenes

COMBUSTION EMISSIONS

- Natural Gas Feedstock
- NO_x and SO_x
- CO and CO₂
- N₂O
- Particulate Matter

GLOBAL AWARENESS

- Price Comparisons
 - Methanol
 - Natural Gas
- Emissions Requirements
- Xylene Demand

PROJECT RECOMMENDATIONS

- Price Lock-Ins
- Natural Gas Plant Attachment
 - Day to Day Variations



QUESTIONS?