Production of Synthesis Gas from the Gasification of Petroleum Coke

University of Illinois

Chemical Engineering

Senior Design Project

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**Abstract**

Proper utilization of raw natural materials is gaining importance now because of environmental impact and a lack of future availability. Crude oil is a prime example, proper utilization means harnessing the maximum potential of all crude oil byproducts. Petroleum coke is a major byproduct that has gone under utilized in the past. The primary goal of this project is to show the utilization of petroleum coke with gasification technology to produce synthesis gas, syngas, to be used in future chemical productions. Petroleum coke feed into an entrained bed gasifier along with steam and oxygen to produces primarily carbon monoxide (CO), hydrogen (H2), carbon dioxide (CO2), hydrogen sulfide (H2S) and methane. The syngas will be cleaned of solids by removing the ash with cyclone and filter technologies. The H2S will be converted into sulfur dioxide (SO2) then into elemental sulfur through the Clauss process. Then the CO2 will be removed and piped into a gulf coast oil reservoir. The remaining clean syngas will go to a water gas shift reactor to properly adjust the desired ratio of CO: H2. The prepared syngas will then be piped to a chemical plant to produce acetic acid.