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Steam Cracking of Crude Oil

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Abstract

In January 2014, ExxonMobil officially opened in Singapore a novel steam cracker that produces olefins directly from crude oil. The Saudi Arabian Oil Company (Aramco) has discussed plans to build a crude-to-olefins complex. SABIC is another company that has looked into direct crude-to-olefins. In this report, we examine some of the technologies required to support the direct production of olefins from crude oil.

We present process design studies for the ExxonMobil and Aramco processes. We present capital and production cost estimates for a facility in Singapore using the ExxonMobil process. We compare the ExxonMobil process in detail with traditional naphtha cracking. In particular, we present side-by-side crude oil versus naphtha comparisons of yield sets, major equipment sizes, and process economics. We also present capital and production cost estimates for a facility in Saudi Arabia using the integrated Aramco crude-to-olefins process.

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