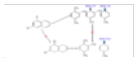


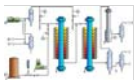


Table 1

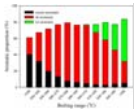
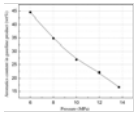


Table 2
Table 3
Table 4



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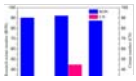

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Direct production of high octane gasoline and ULSD blend stocks by LCO hydrocracking

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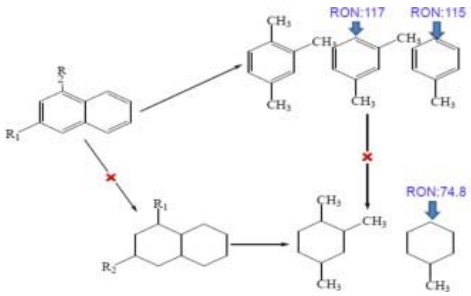
Highlights

- Introduced a LCO hydrocracking technology to produce high octane number gasoline.
- Studied the effects of reaction conditions to the LCO hydrocracking technology.
- It can produce gasoline with an octane number of 91–94, and the low sulfur content.
- The cetane number of clean diesel increased by 10–14 units.

Abstract

Hydrocracking of light cycle oil (LCO) is of great scientific and industrial importance to obtain high quality of gasoline and diesel. In this work, a novel LCO hydrocracking technology (FD2G) was proposed, and three kinds of hydroprocessing catalysts (i.e., FC-14, FC-24 and FC-26) were tested under different pilot-scale operational conditions and/or types. All the three catalysts are found to be active for direct production of high octane gasoline and ultra low sulfur diesel (ULSD) blend stocks, and the FC-24 catalyst is the most active and selective toward production of high octane gasoline. The quality of gasoline and diesel products is highly sensitive to pressure and operation type. Furthermore, the FC-24 catalyst was also tested in a large-scale industrial plant. It is found that the yield of gasoline blend stock reaches 30–50 wt%, the octane number of gasoline is 91–94 and the sulfur content is less than 10 μg/g; the cetane number of diesel blend stock increases 10–14 units in comparison to the feed stock, and the sulfur content is less than 10 μg/g.

Graphical abstract



Keywords

Light cycle oil; Hydrocracking; W-Ni catalysts; High octane gasoline; Ultra low sulfur diesel

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