Catalytic performance and optimization of hydrodesulfurization and naphtha reforming processes for clean fuel production.

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The consumption of petroleum transportation fuels has been increasing in most countries for the past three decades. The demand for such fuels will continuously increase due to the growth of automobile owners worldwide. Absolutely, petroleum for the coming two to three decades will continue to play a major role in satisfying the transportation fuel market demand. Keeping in mind, Fuel consumption, energy efficiency, air quality are of concern nowadays. However, oil based transportation fuels that can now be produced comply with stringent environmental standards. A new guidelines to limit sulfur in diesel fuel to less than 10 ppm and aromatics in gasoline fuel to less than 20 wt %, will proposed in the near future. As a result of insistence on low sulfur and aromatics in transportation fuels, many technologies are available on the market addressing this problem in different ways such as Hydrodesulphurization (HDS) and Catalytic Naphtha Reforming (CNR). HDS process is highly efficient for the removal of light sulfur compounds such as thiols, sulfides but less effective for removing thiophene derivatives (refractory compounds). Meanwhile 60% aromatics are produced during naphtha reforming and their use in reformulated gasoline should therefore be limited. Therefore purpose of this study is to improve the hydrodesulfurization (HDS) activity and hydrodearomatization (HDA) performances used parent bimetallic catalysts (Co-Mo & Pt-Re) and optimize the key operating conditions of these processes in order to fulfill the environment and energy demand.

Key words: catalytic naphtha reforming; hydrodesulfurization; research octane number; CoMo catalyst; PtRe catalyst.