Maximizing the Benefits of Refinery Residue Upgrading

M. Emtir*, M. Edreder, A. Ghait

1Libyan Petroleum Institute, Libya
2National oil corporation, Libya
3Libyan academy, Libya

Abstract

The refining process separates, breaks, reshapes and recombines the molecules of crude oil into value-added products such as gasoline, diesel and aviation fuel. There is not one single upgrading solution that fits all refineries. Changing configurations in fuel demand, the trends to processing heavier crudes and increasing refinery complexity, and the growing globalization and trade in refined fuels, have introduced new dynamics to the economics of refining, and have shifted the drivers of refinery profitability.

Refineries are classified according to the number of processes available for transforming crude into petroleum products. Simple refineries are designed to distil crude oil into a limited range and yield and products. They are referred to as topping or hydro-skimming plants. Topping is the most basic distillation process. Hydro-skimming involves distillation in the presence of hydrogen. Complex refineries involve a combination of interrelated processes to produce a broader range of refined products. They commonly utilize thermal and catalytic cracking that enables deeper conversion of the crude oil feedstock into higher yields of more valuable and marketable products.

Two scenarios have been proposed taking into account techno-economic analysis issues of the results. Obtained results show that, the scenario which included (Fluidized catalytic Cracking, (FCC) and delayed coking) has shown the optimum in terms of both maximum gasoline and less capital cost compared with that included the FCC and visbreaking processes.