

GLOBAL E-CONFERENCE ON CHEMISTRY AND CHEMICAL ENGINEERING

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Desulfurization and removal of mercaptan from U4 diesel using ethanol-methanol mixture in order to prepare U5 diesel and feasibility of solvent regeneration using membrane process [Scrubbing Gasoil With Ethanol-Methanol Mixture]

Sulfur pollutants are one of the compounds found in various hydrocarbon cuts in refining and petrochemical processes. In fact, in a refinery, after distilling crude oil and turning it into light to heavy fractions, sulfur compounds are also distributed in all products obtained from distillation and it is natural that heavier compounds will have a larger share of sulfur. Investigations indicate that with the passage of time and heavier crude oil entering the refineries, the amount of sulfur compounds in the hydrocarbon fractions from the distillation tower has also increased, or in other words, in the hydrocarbon structure of petroleum derivatives such as diesel, there are sulfur compounds that have caused problems in industrial uses and refining operations. Therefore, removing or reducing this element from petroleum hydrocarbons is one of the important goals in the refining industry on the other hand considering the application of environmental regulations to produce refined products such as gasoline and diesel in accordance with quality and environmental standards, has led refiners to use processes to reduce the amount of sulfur and polluting compounds in hydrocarbon cuts. In the meantime, one of the most important quality improvement processes in the refining industry is the hydrotreating processes of various cuts in a refinery, and of course, considering the results of the experimental data of the operational samples of the products resulting from such processes it has been found that this reduction of sulfur compounds and other pollutants can be reduced to some extent in terms of environmental standards, also considering the cost-effectiveness of the final product and minimization of undesirable substances requires additional side processes. One of these complementary methods is washing the product under special conditions with ethanol-methanol mixture, which in this research is subject to scientific investigation and field tests to validate the design in line with implementation on a laboratory scale (Test Pilot) and then implementation on an industrial scale. will be placed

In order to achieve the goals mentioned above, in the first stage, by changing the operating variable parameters (temperature, pressure, molar flow and type of solvent), the performance of the absorption tower was determined, and by changing the type of solvent in the tower and using the Taguchi method, the results were recorded and analyzed. placed (at this stage, the amount of sulfur compounds is brought to less than 50ppm). Then, in the second stage, according to the results recorded in the previous stage, the most optimal mode is selected and the product of the first stage is entered as feed to the second absorption tower (Scrubber Tower) with specific operating parameters. Sulfur compounds reach less than 5ppm and are reduced according to the standards mentioned in the EURO5 area.

In addition, in the stage of reduction of ethanol-methanol consumption, due to the difference in molecular size in the mentioned solvent molecules and the molecules of sulfur compounds as well as mercaptans absorbed by using the membrane separation process by UltraFiltration membrane based on the size capability of this type of membrane, pure Making and recycling the primary ethanol-methanol solution has been studied practically for re-efficiency in the absorption process.

Keywords: Desulfurization _ removal of mercaptan _ U4 diesel _ ethanol-methanol _ U5 diesel _ membrane process

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Biography:

I Born on 13February 1989,with a bachelor's degree in Chemical Engineering - Petrochemical Industries (AmirKabir University of Technology,Mahshahr Polytechnic Branch from 2007 to 2012),a Master's Degree in Chemical Engineering - Process Design Engineering (IsfahanUniversity - Faculty of Engineering, Chemical Engineering (since 2015 until 2017) and is currently a PhD candidate (doctoral student) in the final defense stage of the chemical engineering doctoral thesis of Isfahan University of Technology (entry in the national exam 2019).

Since 2011,I have been working in Lavan Oil Refining Company and in Catalytic Conversion Units (CRU) as a Site Man (from 2011 to 2013),Liquid Gas Purification and Desalination (LPG) Unit as a control room employee.(From 2013 to 2015,Heavy Naphtha Refining and Converting Unit to Gasoline (CCR) as the head of the start-up and operation group (from 2015 to 2016),in the hydrogen purification unit (K&G-HDS) as the head of the start-up group and Operation (from 2016 to 2018),in the aromatic conversion unit of hydrocarbon rings to gasoline (ISO) as the head of the commissioning and operation group (from 2017 to 2019) and then in the unit of vibration analysis and equipment Sensitive Rotary(CBM)I have worked as a technician,then as an expert,and now as a senior expert in vibration analysis of rotating equipment (since 2019 until now)

[Catalytic conversion unit area employee/Catalytic conversion unit control room employee and senior employee/catalytic conversion unit startup group manager/CBM unit senior supervisor]

My current working conditions are satellite (14 working days and 14 days rest) and I dedicate my free time to studying in the fields of education and scientific research.