



The Choice of the Optimal Retrofit Method for Sections of the Catalytic Reforming Unit

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Hydrotreating section and catalytic reforming section of catalytic reforming unit L-35-11/600 were examined in this paper. This unit was designed for processing large fraction of naphtha by catalytic reforming in order to obtain components of gasoline with an octane number 78-85 points. Pinch diagnostics for these sections was carried out. Comparative economic analysis of their effectiveness after the proposed retrofit was performed for each section separately and for the total their flowsheet.

The paper provides the retrofitting of Kherson Refinery using the Pinch Analysis methodology. The catalytic reforming unit L-35-11/600 was investigated and obtained data for the process streams were analyzed. The design, which enables to process larger fraction of naphtha by catalytic reforming in order to obtain components of gasoline with an octane number 78-85 points, is proposed. The observed unit consists of three main sections: hydrotreating section, catalytic reforming section, deethanization and stabilization catalysate section. The feedstock of this unit is naphtha. The analysis of the scheme showed significant energy saving potential which is contained both in elementary heat loss to the environment and in irrational technology of heat transfer between process streams.

Heat recovery power of the hydrotreating section and catalytic reforming section was calculated. It is equal to 12 MW for hydrotreating section, 21 MW for catalytic reforming section and 32 MW for both these sections. The Pinch Integration of the HEN for this units was carried out and the retrofit steps were proposed. Comparative economic analysis of their effectiveness after the proposed retrofit was performed for each section separately and for the total their flowsheet. The implementation of the proposed retrofit allows to reduce power consumption for hydrotreating process by 2.2 MW, the payback period of the proposed project will be about 7 months. For the catalytic reforming section power consumption is reduced by 6.4 MW, the payback period of the proposed project will be about 10 months. Energy consumption for joint integration of hydrotreating section and catalytic reforming section reduced by 11.4 MW, the payback period of the proposed project will be about 8 months. Therefore, it was concluded that pinch design for these sections of catalytic reforming unit L-35-11/600 the most advisable to carry out for the two sections together.

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