

ABSTRACT OF THE INVENTION

Process for Recovering Olefins From Cat-Cracked Gas Without Accumulating Undesirable Oxides of Nitrogen

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Recovering olefins from cat-cracked gases without the accumulation of dangerous amounts of nitrogen oxides is achievable in a safe, effective, and economical manner by conducting the recovery at temperatures that are high enough to prevent the oxidation of nitric oxide (NO) to form nitrogen dioxide (NO₂) and high enough to prevent the accumulation of unwanted nitrogen oxides. One way to achieve this result is using well known absorber technology to operate the demethanizer rather than using the typical cryogenic technology. A stream of cat-cracked gas first is scrubbed to remove acid gases, including nitrogen dioxide (NO₂), and then is passed through a depropanizer fractionation tower. Hydrocarbons having four or more carbon atoms are recovered in the bottoms of the depropanizer, and the overhead from the depropanizer -- which is composed of hydrocarbons having three or fewer carbon atoms -- is sent to an absorber demethanizer tower. Hydrocarbons having two or more carbon atoms are recovered in the bottoms from the absorber demethanizer tower, where temperatures are no lower than about -46°C (-50°F). The overhead from the absorber demethanizer tower -- which is composed of methane, hydrogen, and trace amounts of nitrogen oxide, C₂, and absorbent (C₃) -- then is chilled to condense and recover trace amounts of C₂ and heavier gases, including trace amounts of the C₃ absorbent, at temperatures of about -101°C (-150°F) or higher.

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