

Intelligent Chemistry Approach to Improvement of Oxygenates Analytical Method in Light Hydrocarbon by Multidimensional Gas Chromatography - FID and MS

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Abstract : Butene-1 product is considered effectively raw material in Polyethylene production, however Oxygenates impurities existing will be effected ethylene/butene-1 copolymers synthesized through titanium-magnesium-supported Ziegler-Natta catalysts. Laterally, Petrochemical industries are challenge against poor quality of Butene-1 and other C4 mix - feedstock that reflected on business impact and production losing. In addition, propylene product suffering from contamination by oxygenates components and causing for lose production and plant upset of Polypropylene process plants. However, Multidimensional gas chromatography (MDGC) innovative analytical methodology is a chromatography technique used to separate complex samples, as mixing different functional group as Hydrocarbon and oxygenates compounds and have similar retention factors, by running the eluent through two or more columns instead of the customary single column. This analytical study striving to enhance the quality of Oxygenates analytical method, as monitoring the concentration of oxygenates with accurate and precise analytical method by utilizing multidimensional GC supported by Backflush technique and Flame Ionization Detector, which have high performance separation of hydrocarbon and Oxygenates; also improving the minimum detection limits (MDL) to detect the concentration <1.0 ppm. However different types of oxygenates as (Alcohols, Aldehyde, Ketones, Ester and Ether) may be determined in other Hydrocarbon streams as C3, C4-mix, until C12 mixture, supported by liquid injection auto-sampler.

Keywords : analytical chemistry, gas chromatography, petrochemicals, oxygenates

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