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A method development for characterization of fischer tropsch liquids in GC

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The analysis of Fischer–Tropsch products is a challenging topic due to their complex nature. FT liquids comprise of various types of hydrocarbons, namely n-paraffins, α-olefins, aromatics and oxygenates. A basic approach to classify these compounds is required. In this study gas chromatographic analyses were performed to reach a methodology for the characterization of FT liquids. The following parameters were investigated for GC method development: i) Carrier gas type, ii) Optimum (and applicable range of) carrier gas velocity, iii) Injection temperature, iv) Split ratio, v) Oven temperature program. Optimum values of these parameters were determined, regarding to their effect on resolution of the peaks (Rs) and Total analysis time (t).

Hydrogen was selected as a carrier gas due to the points like enabling shorter analysis times, wider carrier gas working velocity ranges and higher peak resolutions. Helium shortage in the market was another concern affecting the choice the carrier gas. Using Van Deemter equation, optimum carrier gas velocity was determined for C5-C36 n-paraffin samples representing the FT liquids. Optimum split ratio and GC oven temperature program (initial temperature, hold time and heating rate) were developed. As a result, the determined values of each investigated parameters are listed below:

- Working carrier gas velocity is 50 sec/cm,
- Split ratio is 275,
- Injector temperature is 300 ^{0}C,
- Initial temperature, hold time and heating rate of GC oven temperature program are 35^{0}C, 10 min and 2 ^{0}C/min, respectively.

Biography

Dr. Eyup Simsek is in charge of 7th FP BRISK-The European Research Infrastructure for Thermochemical Biomass Conversion of Biomass project on behalf of TUBITAK MRC Energy Institute. He is representative of TUBITAK MRC in EERA Bioenergy. He has participated in ten national and international projects. He is having ten years' experience in research and project management in different energy areas related to the study of heterogeneous catalysis: fuel processing, fuel production from coal and biomass, catalyst characterization, and microchannel reactors. He is the author of 5 publications in the international citation index.

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