

## Development of measurement techniques for determination of main and hazardous components in biogas utilized for energy purposes

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This is the necessary to measure and control concentrations of main and hazardous components in biogas utilized for energy purposes. Study aims to develop a sampling method and gas chromatography (GC) -electron capture (ECD), -thermal conductivity (TCD), -flame ionization (FID) and -mass spectrometry (MS) analysis for determination of main and hazardous biogas components. In a board sense, the analytical methods were standardised, and trimethylsilanol (TMSOH), volatile methylsiloxanes (VMSs), volatile organic compounds (VOCs), oil mist (OM), and halogenated components were determined, afterwards. Sampling procedure based on direct biogas absorption allowed to exclude the extraction process. As result, the time of analyse was significantly reduced. Field study clearly showed concentration of siloxanes in analysed samples was significantly elevated. Therefore, the impact of biogas silica-contaminants on gas-motor action was explained and extensively discussed. VMSs and TMSOH concentrations were recalculated and expressed in toluene equivalent ( $T_{eq}$ ). The interpretation of obtained data was provided. Moreover, we have successfully proven the  $T_{eq}$  is not appropriate differentiating factor of VMSs concentration determining. The promising results obtained in this study indicate this novel sampling procedure, and the standardisation of analytical methods constitutes a promising approach to accomplish the complete procedure of biofuels analysis.

### Biography

Grzegorz Piechota has completed his M.Sc at the age of 24 years from Nicolaus Copernicus University. Currently, he studies on 4<sup>th</sup> year of postdoctoral level from Nicolaus Copernicus University, Faculty of Chemistry. He is the member of Polish Engineers and Technicians Association of Chemical Industry. He has published more than 6 papers in international journals and he act as reviewer in International Journal of Environmental Analytical Chemistry.

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