

FATTY ACID ETHYL ESTERS AS BIODIESEL FUEL: PRODUCT QUALITY AND EFFICIENCY OF VARIOUS PURIFICATION TECHNIQUES

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Abstract. The efficiency of removal of glycerol, soaps, and unconverted acylglycerols by repeated washing with water, alcohol removal by distillation, distillation of esters, and using of sorbents, as well as a combination of these techniques, was evaluated. The use of a number of commercially available sorbents (Magnesol, talc, and coal) and ion exchange resins (KU-2-8, Purolite CT275) was investigated. Glycerol and soap were found to be effectively removed with all tested materials except talc, while Magnesol and Purolite also effectively removed monoacylglycerols. However, none of the materials tested was able to withdraw diacylglycerols. A three-stage purification of esters was proposed. The latter includes the alcohol removal by distillation, which contributes to the additional settling of pollutants, vacuum distillation, and final use of sorbents (Purolite). The utilization of the indicated stages allows obtaining a product that meets the quality indicators of EN 14214. The proposed approaches will be valuable in the engineering of industrial technology for obtaining fuel-grade ethyl esters.

Keywords: fatty acid ethyl ester, purification, sorbent, distillation and ion exchange resin.

Received: 20 September 2024/ Revised final: 27 November 2024/ Accepted: 29 November 2024
