

## **QUALITY CONTROL OF DIESEL, GASOLINE, JET FUEL AND LUBRICANTS WITH LABORATORY AND PROCESS NEAR INFRARED SPECTROSCOPY**

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In the past years, there has been a significant push to reduce the environmental impact and subsequently increase sample permeability in the petrochemical industry through improvements to fuels and lubricants quality.

These steps involve the use of precise and accurate analytical methods that won't be time consuming, expensive and will ensure the best possible product quality. One of these methods is near infrared spectroscopy which can analyze a variety of physical and chemical properties that affect the performance and use of fuel and lubricants. Of course, this secondary method can be supplemented by classical titration methods, which are based on published by the ASTM or ISO resulting in perfect synergy.

Aims of this research were to develop accurate and cost-efficient spectroscopy (VIS-NIR) methods for the multiparameter QC analysis of fuels and lubricants. Effectiveness of these methods were verified by primal methods to fulfill norms demands. Subsequently, these methods were transferred to use in petrochemical industry, and resulted case studies were made.

Presented case studies include determination of key quality parameters, namely octane number (RON, ASTM D2699-19), motor octane number (MON, ASTM D2700-19), aromatic content (ASTM D5769-15), cetane index (ASTM D613), flash point (ASTM D56), cold filter plug point (CFPP) (ASTM D6371), D95 (ISO 3405), viscosity at 40°C (ISO 3104), API gravity, flash Point, total acid number, hydroxyl number, freeze point and many more for diesel, gasoline, jet fuel and lubricants.