INVESTIGATION OF WEAR METALS IN BIOFUEL VEHICLES LUBRICATING OILS BY ENERGY DISPERSIVE X-RAY FLUORESCENCE SPECTROMETRY

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Lubricating oils are used in engines to prevent the wear of moving parts and their main function is to reduce friction, provide oxidation stability, promote internal cleansing and increase the durability of the equipment. In the contemporary world, the amount of different types of vehicles has grown expressively; therefore, it is vital to determine the wear metals in lubricating oils for the environmental pollution control, population health prevention and, also, the engine evaluation in the automotive industry.
In this work, wear metals, such as Ca, V, Cr, Fe, Ni, Cu, Zn, Ag, Cd and Pb, in used lubricating oil from biofuel cars, was determined by Energy Dispersive X-Ray Fluorescence spectrometry (EDXRFS). The used lubricating oils sampling was carried out in an Authorized Car Dealer´s, as to type of fuel (gas, alcohol or mixture users) and mileage. Also, unused oils from different labels were collected.
Two sample preparations were studied: direct analysis, *i.e.* in liquid form, placed in adequate sample holder, where the X-ray analysis was performed without any sample preparation; and in layered form (thin film), where 50μL of the sample was deposited onto Whatman No. 41 filter paper and dried under infra-red lamp. For each group, a better instrumental condition analysis (atmosphere and measurement conditions) was carried out.
Individual calibration curves were obtained from certified materials and evaluation of the method was made using certified reference material.
Sensibility, quickness of analysis, precision and accuracy for each sample preparation are discussed.