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INVESTIGATION OF THE COMPOSITION OF POLLUTANTS IN HYDRAULIC OILS OF HYDRAULIC EQUIPMENT IN THE KYZYLKUM DEPOSITS

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Abstract: Recently, the main problem in the operation of hydraulic excavators is the contamination of hydraulic fluids with various minute dust impurities of rocks. As a result, there is a rapid wear of the parts of such machines. The article is devoted to the clarification of the composition of contaminated impurities. Microscopic analysis was used to study the clogging of hydraulic oil. The viscosity of the studied samples after their distillation decreased in comparison with the initial ones.

Keywords:. hydraulic fluids, IR spectra, viscosity, density, distillation, butanol, cyclohexane, microscopic analysis.

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Quantitatively, the fraction of inorganic particles (practically adequate to the so-called "ash content") in the total mass of contaminants is usually about 50%, increasing as the purity of the liquid [4, 5]. The qualitative composition of inorganic impurities is illustrated in Fig. 1, data obtained by analyzing 172 g of sludge extracted from working fluids hydraulic systems of construction and quarry excavators. It should be borne in mind that the specifics of operating conditions significantly affect the physicochemical composition of contaminants.

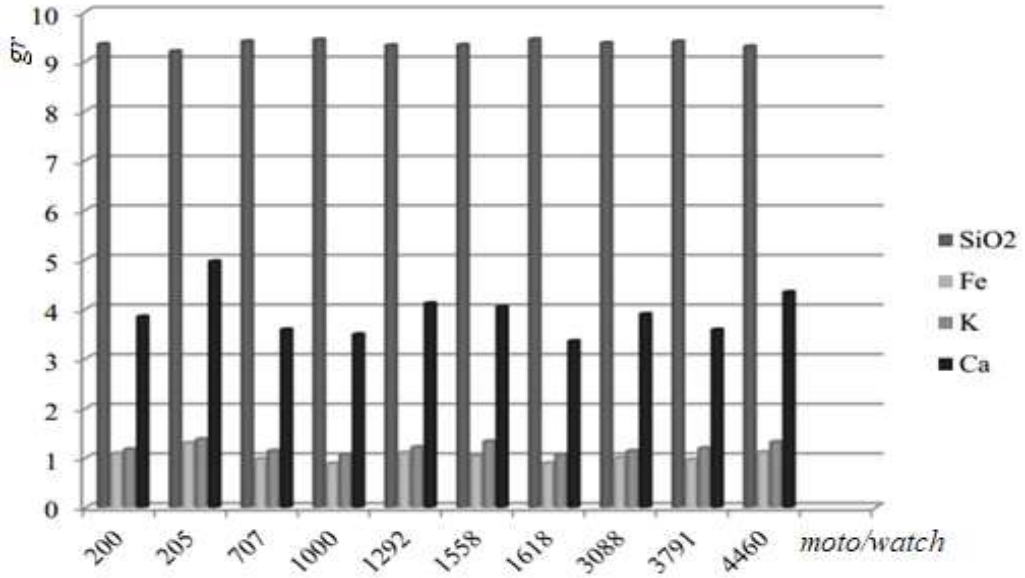

Figure 1. Composition of pollutants

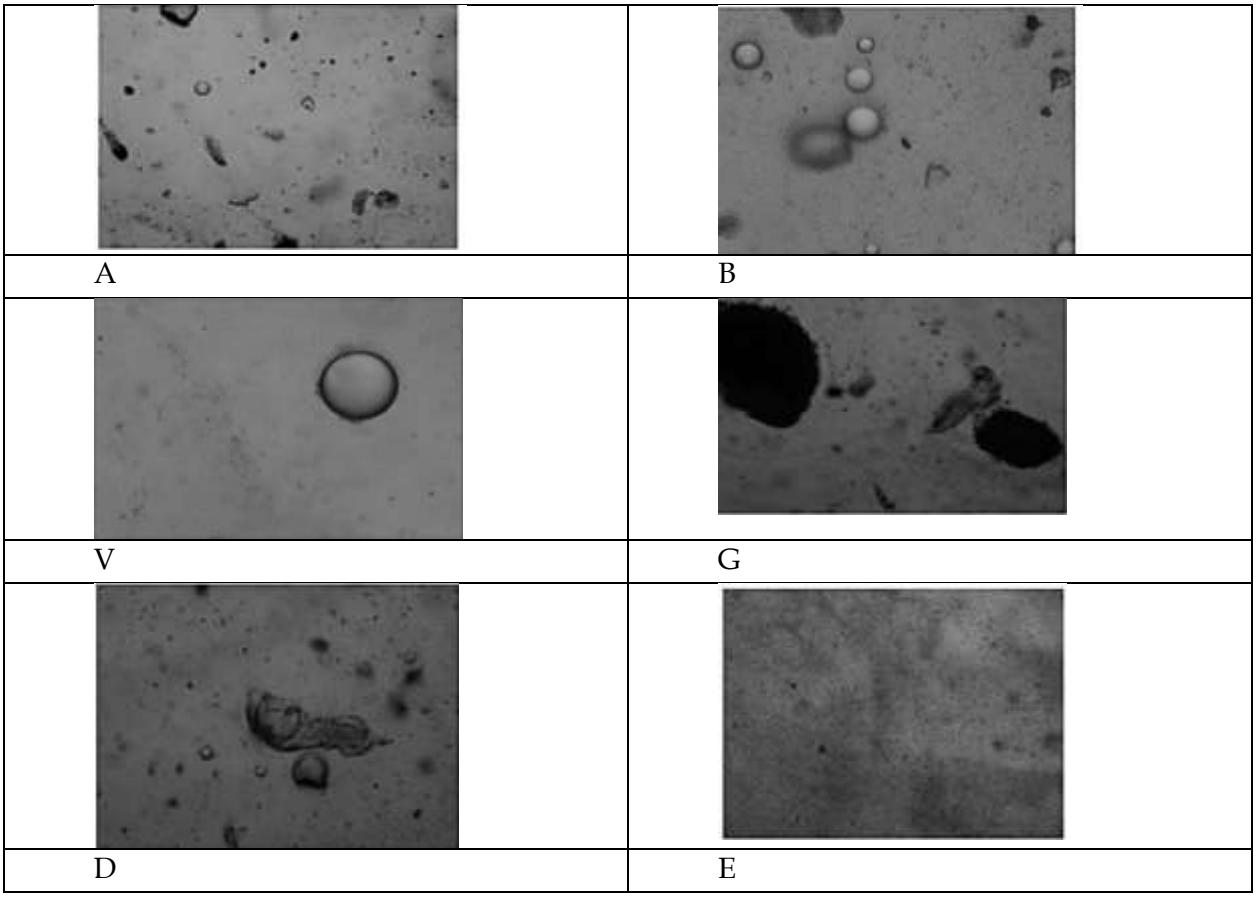

Figure 2. Microscopic analysis of hydraulic oil clogging Tellus-68, worked 3088 hours

Translation results in the 3,088 hours of hydraulic oil Tellus-68 hydraulic oil under a microscope microscope, solid particles in the form of corrosion products can be seen, metal particles in contact with oil, wear products, water (in the form of round transparent halos), silica dust, and rarely occurring pieces of rubber (Fig. 2).

Translation results In images V, D, G, and E the dust is seen as tiny particles and metal chips are seen as light brown particles with irregular edges of particles. In photos A and B a piece of piece of rubber with the presence of small metal chips. The oil was used for 3,088 engine hours at Vostochny mine in the hydraulic system RH-40E excavator. Microscopic analysis fouling of hydraulic oil Tellus-68, that worked 3,560 moto-hours is shown in Fig. 3. [1, 2,3,6,7,8]

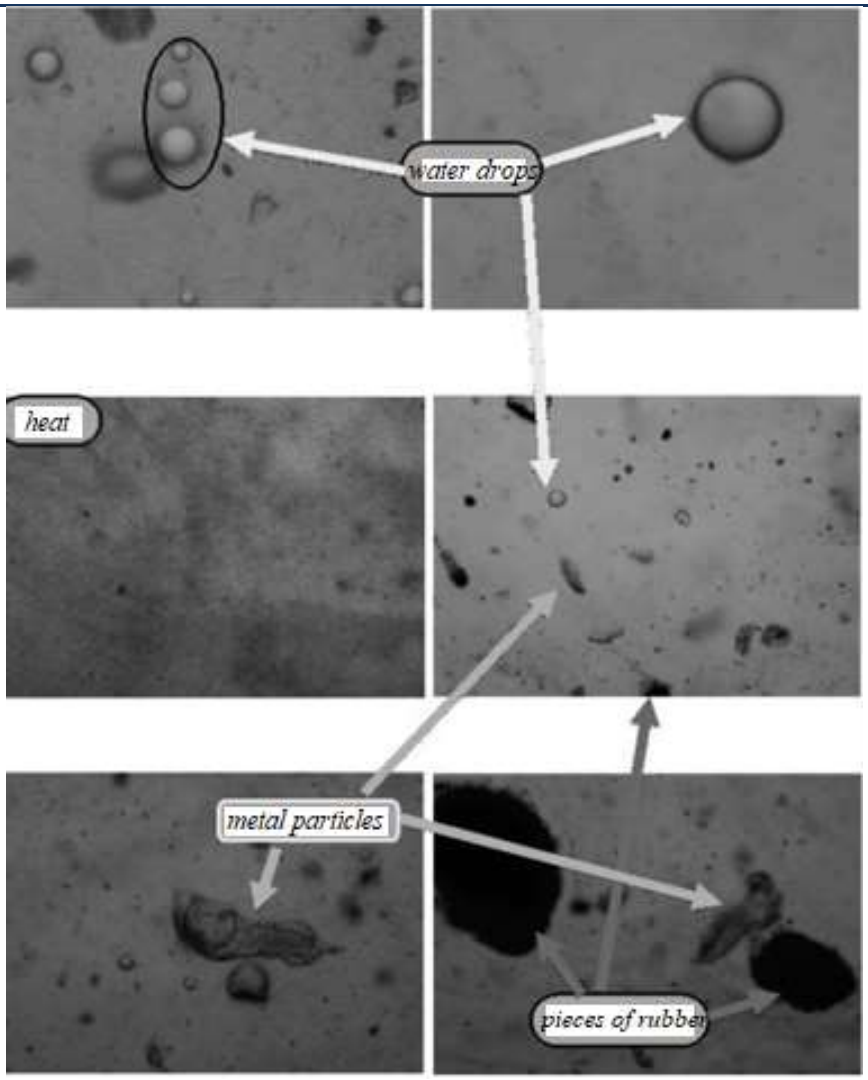

Figure 3. Microscopic analysis of Tellus-68 hydraulic oil clogging, after 3,560 engine hours

It has been established that the specifics of operating conditions of hydroficated mining machines significantly the specific operating conditions of hydroficated mining machines significantly affect the physico-chemical composition of contaminants of hydraulic fluids. Proposed various methods of analyzing the working fluid of a hydraulic volumetric power unit for hydroficated mining machines are acceptable, and they fully and completely correspond to the modern requirements. It is established that abrasive particles in hydraulic oil lead to early wear of pumps' rubbing components with their subsequent destruction. This results in clogging of the hydraulic system and is one of the main reasons of the failure of pumps and hydraulic system components. This is one of the main causes of failure of pumps and hydraulic system elements.

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