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INFLUENCE OF PHENOL CONTENT ON SOME OPERATIONAL PROPERTIES OF ABSORBENT OILS

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The shutdown of centralized processing of phenolic raw materials once again raises the issue of the need to implement the process of dephenolization of the wash oil and to consider the feasibility of standardizing the phenol content in it. This problem has a history as long as the use of a coal tar wash oil as absorbent for capturing benzene hydrocarbons. Recent studies have emphasized the importance of studying the effects of oil degradation initiators such as ammonia, hydrogen sulfide, resins, iron and corrosion products. The purpose of this study was to conduct an experiment to determine the effect of phenol content in the absorbing oil on certain characteristics. This was intended to provide additional arguments to justify the feasibility of implementing the process of dephenolization of benzene hydrocarbon absorbers. A mixture of phenols was added to the sample of working oil in the following approximate ratio, in which they are in the absorbing fraction, namely 30 % xylenol isomers, 5 % cresol isomers, 65 % higher phenols (β-naphthol). Electrochemical determination of the corrosion rate of the solution obtained from aqueous extracts of oil samples showed that the presence of phenols does not increase corrosion processes caused by the presence of aggressive components. It can even be argued that the presence of phenols somewhat reduces corrosion processes by forming a film on the metal surface or reducing the concentration of active components near its surface. It was found that oil with phenol additives above the usual phenol content does not show a significant increase in the tendency to coke formation. On the contrary, higher phenols are inhibitors of radical oxidation reactions, which occur up to a certain limit in the processes of coke formation. Moreover, phenols show some inhibitory effect in a fairly wide temperature range (430-800 °C).

Keywords: absorbent oil, phenols, dephenolization of the heavy fraction, corrosion rate, coke number.

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