

PRODUCTION OF ROAD OIL BITUMENS BY THE METHOD OF CHEMICAL MODIFICATION OF OIL RESIDUES

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The article is devoted to obtaining road oil bitumen from oil residues by modifying them with relatively cheap low molecular weight organic substances. The proposed method relates to a chemical modification, which, in case of its industrial implementation, will allow avoiding the use of expensive physical modifiers.

A 37 % aqueous solution of formaldehyde was used as low molecular weight organic substances (modifier / chemical reagent of the process) for chemical modification of tar; concentrated sulfuric acid (H_2SO_4) was used as a catalyst for the chemical modification of tar. As a feedstock for chemical modification, we used an oil residue - tar, selected at PJSC "Ukratnafta" (Kremenchug, Ukraine).

The chemical modification with formaldehyde was carried out in hermetic stationary containers capable of operating under excess pressure. The photographs of the equipment are given. Since the ultimate goal of the work was to obtain road oil bitumen, then, analyzing the results of experimental studies, we focused on the quality characteristics of this particular product. At the same time, the most important quality indicators were determined, namely: the depth of needle penetration, softening temperature, ductility (extensibility), adhesion to glass (adhesion to glass), Fraas brittle temperature, penetration index. For tar, the following characteristics such as density, flash point in an open crucible, and a boiling point were additionally determined. As a result of the experiments, the fundamental possibility of obtaining road oil bitumen by the method of chemical modification of tar with formaldehyde was established. It was revealed that the process factors (formaldehyde content in the reaction mixture, catalyst content in the reaction mixture, temperature and duration) have a significant effect on the quality of the resulting product. Changing their values allows you to adjust the values of the quality characteristics of the resulting bitumen.

Keywords: binders, bitumen, oil residue, modification.

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