

P-34: Influence Ultrasound Cavitation In Preparation Bitumen Modified With Epoxy Rapeseed Oil

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Bitumen, by their nature, even high-quality, can not provide long-term performance of coatings. In particular, they are characterized by low rheological properties. For address these deficiencies in high quality bitumen obtaining are used modifiers different nature. In particular, in the world 100% of the top layer of pavement made with modified bitumen. It is known that the introduction in road bitumen epoxides improves their physical and chemical properties such as adhesion, softening temperature, penetrations, extensibility and others [1].

We investigated process modification of bitumen epoxy additives based on plant material and found that modified bitumen with epoxy compounds of higher olefins based on renewable raw materials allows to improve the operational characteristics of road surfaces. A detailed study of general regularities of bitumen modification, including the influence number of modifier and conditions of obtaining high quality modified bitumen showed that depending on the content of additives and method of its introduction, allow to obtain bitumen with different properties [1].

Preparation of such a compositions requires high temperatures (160-180 ° C) and long reaction time (3-5 h). For time reduce and improve of the reaction conditions we investigated the influence of ultrasonic cavitation on modified bitumen. Found that ultrasound does not affect thermal decay of epoxide, because it has no effect on the processes of decay of organic peracid [2]. To study used ultrasound unit UZDN-2T.

During treatment with ultrasound compositions of bitumen and epoxides rapeseed oil, the time of modification reduced to 2 hours. Nevertheless physico-chemical properties such as penetrations, extensibility remain without significant changes, although the adhesion of bitumen modified with the use of ultrasound increases by 4-5%, and softening temperature increases by 1-3 ° C.

References

1. Hrynychuk Y.M., Nykypanchuk M.V. "Epoxy compounds based on rapeseed oil as a modifier for road bitumen" Visnyk, NY "Lviv Polytechnic".
2. Mokry E.M., Starchevsky V.L. "Initiation and Catalysis Oxidation Processes of Organic Compounds in an Acoustic Field" // *Advances in Sonochemistry*. – London. – 1993. V.3. – P. 257-292.