EXCELLENCIA
INTERNATIONAL MULTI-DISCIPLINARY JOURNAL OF EDUCATION
Volume 02, Issue 02, 2024 ISSN (E): 2994-9521

Methods of Obtaining Modified Serobitum

Rosilov Mansur Sirgievich [1], Umidjonova Gulhayo Shuxrat qizi [2]

[1, 2] (PhD), Associate Professor, Karshi Engineering and Economic Institute, Republic of Uzbekistan, Karshi

Abstract:

Analysis of methods of production of serobitum. Adding the necessary components to the composition of serobitum and obtaining serobitum with a high degree of strength on their basis. They improve the physico-chemical properties of serobitum.

Keywords: serobitum, bitumen, sulfur, urea.

The introduction of new effective road building materials for the construction of pavements and foundations of highways is an urgent task, including the development and application of resource-saving technologies aimed at the use of low-demand large-scale mineral materials, semi-finished products, industrial waste and their by-products. The traditional material for constructing road surfaces has been and remains asphalt concrete and its most effective form – polymer asphalt concrete. However, the use of the latter requires an appropriate feasibility study. A broad area is the possibility of using recycled old asphalt concrete or asphalt granulate (AG) as part of road mixtures for the construction of bases and surfaces of highways[1]. The invention relates to construction, namely to methods for producing road building materials, in particular, to a method for producing sulfur bitumen, including preheating bitumen, mixing sulfur and bitumen by cavitation-acoustic action, in which pre-heating of bitumen is carried out by cavitation-acoustic action to a temperature of 160±2°C, in this case, sulfur and residual oil bitumen are used, and to maintain the temperature at 160 ± 2 ° C, cavitation-acoustic action is used, which is carried out for 15-20 minutes by ultrasonic exposure to vibrations with a frequency of 18-68 kHz, pulse-width modulated in the frequency range 10 -400 Hz [2].

Thickening with sulfur is recommended in cases of using viscous bitumen for the preparation of asphalt concrete mixtures in the Republic of Uzbekistan, where it is necessary to increase the softening temperature of bitumen to increase the shear resistance of road surface layers and the adhesive ability of binders used to construct layers of road “clothing” using the method of mixing on the road. This option for improving the properties of an organic binder is effective when using

low-viscosity organic components, such as heavy crude oil, straight-run tar, and liquid bitumen. They are modified by adding 15 - 25% sulfur, when the resulting products are able to replace standard binders - viscous bitumen. There are three main reasons for the successful use of sulfur. The first is the possibility of reducing bitumen consumption - by reducing the bitumen content in sulfur bitumen binders due to the addition of cheaper and available in significant quantities of sulfur, it reduces the cost of constructing road pavements [2].

It was revealed that the decrease in the resistance of sulfur asphalt concrete to the effects of liquid media is due to the presence in the contact zone "petroleum bitumen - mineral filler" of water-soluble sulfur-containing compounds formed during the chemical interaction of technical sulfur with the mineral filler, as well as the crystallization of sulfur, leading to increased permeability and intensified access of liquid to contact zone "petroleum bitumen – mineral filler". A model has been developed that establishes a relationship between the volume of additional open porosity of sulfur asphalt concrete, resulting from sulfur crystallization, with the geometric characteristics of the forming channels (capillaries) and sulfur content. 5 It has been established that the dependence of additional open porosity on the volume fraction of sulfur is linear, indicating the increasing influence of the geometric characteristics of the channels formed during sulfur crystallization. A model of coalescence of sulfur bitumen emulsion has been developed, which substantiates the extreme nature of the influence of sulfur content on the crack resistance of sulfur asphalt concrete (the maximum tensile strength during splitting at 0 °C is observed at a sulfur content of 30%). It has been established that the coalescence of sulfur droplets is an energetically favorable process, the driving force of which is the excess Laplace pressure arising due to the difference in the geometric dimensions of the contacting sulfur particles. Coalescence of molten sulfur droplets leads to the formation of extended spatial structures consisting of sulfur, which is a brittle substance at normal temperatures [3].

The methodology used in the dissertation work consisted of a systematic study of the properties of bitumen, their modification, research and optimization of physicochemical properties and dispersed structure, as well as the development of technological methods for producing bitumen for industrial use. The work used general scientific and standardized methods (laboratory and industrial experiments), as well as special methods (programming the oxidation process, mathematical modeling, identifying correlations) [4].

LIST OF REFERENCES USED

1. Fomin A.Yu. Cast sulfur concrete based on asphalt granulate. News of KGASU, 2018, No. 2 (44) 208-2014c.
2. Patent No. 2725227 Russia Method for producing sulfur bitumen, Nikitchenko N. V C08L 95/00 (2006.01) Abstract SAMGTU-2007.
3. Le Huu Tuan Gray asphalt concrete with increased water resistance for the Asia-Pacific region, Abstract St. Petersburg – 2022
4. Tyukilina P.M. Integrated technological regulation of the production of modern road bitumen binders. Abstract Moscow, 2021g.