The Technology for Production of Road Bitumen Modifier Using Aluminum Silicate Microspheres Extracted from Ash and Slag Waste of Energy Industry

A. V. Taskin, Yu. S. Belyakov, D. R. Fedotov,
R. S. Fediuk, L. A. Alekseiko, O. V. Zhdaneev,
D. A. Salanin, S. I. Ivannikov, N. S. Vertikova

Far Eastern Federal University, Vladivostok, Russia;
Gomel State Medical University, Gomel, Republic Belarus;
Competence Center for Technological Development of Fuel and Energy Complex "REA" of the Ministry of Energy of Russia, Moskva, Russia;
Institute of Chemistry of the Far Eastern Branch of the RAS, Vladivostok, Russia

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Abstract: The results of the research on the development of technological solutions for the production of a new rubber-bitumen binder for asphalt concrete based on industrial waste: used tires, used automobile oil and aluminosilicate microdispersed spheres obtained from the processing of ash and slag waste (ASW) of thermal power plants are presented. The proposed technological solutions make it possible to produce high-quality polymer additives for modifying the properties of road bitumen. The novelty of the developed approach lies in the use of micro-sized hydrophobized aluminosilicate spheres to obtain a granular modifier, which are released as an additional product during the complex processing of aluminosilicate. The positive economic efficiency of technological solutions is ensured by the use of large rubber crumbs (more than 8 mm) or crumb rubber, their devulcanization together with hydrocarbon fractions of used motor oil and petroleum bitumen at a given temperature until a gel-like mass is formed, which is subsequently subjected to mechanical grinding in a mill. The resulting modifier was tested in real conditions and confirmed high performance characteristics in the production of asphalt with specified properties for regions with different climates.