

TESTING OF COUMARONE-INDENE-CARBAZOLE RESIN AND BITUMEN MODIFIED BY IT

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The article shows the importance of research aimed at obtaining road bitumen modifiers from non-target products of coal thermal processing, in particular, by further processing of high-boiling fractions that are separated from liquid coal coking products. The results obtained in this area indicate the effectiveness of using modified coumarone-indene-carbazole resins as a polymeric modifier of road oil bitumen.

Laboratory tests were carried out. As starting materials, we used bitumen of BND 70/100 grade, obtained at PJSC "Ukratnafta", and coumarone-indene-carbazole resin synthesized by ionic co-oligomerization from a narrow coumarone-indene fraction (140-190 °C) and carbazole. The modification of road bitumen with coumarone-indene-carbazole resin was carried out to determine the quality characteristics of the resulting modified binder. By changing the mass content of coumarone-indene-carbazole resin in bitumen, several series of modification were performed. The resin consumption was set based on the consumption of industrial adhesives – 0.1 to 2.0 % by weight. The conditions for mixing the modifier with bitumen were as follows: temperature – 190 °C; duration – 60 minutes; modified Reynolds criterion – 109500.

Using the modified bitumen, an asphalt mix was prepared, the corresponding asphalt concrete was produced and its quality was analysed. It was found that modification of BND 70/100 road bitumen with coumarone-indene-carbazole resin significantly improves its adhesion, while slightly deteriorating its thermoplastic properties. Coumarone-indene-carbazole resin ultimately improves the physical and mechanical properties of ASG.Dr.Sh.A.NP.I. asphalt concrete, in particular, the water saturation and compressive strength at 20 °C.

Keywords: oil processing, coal processing, bitumen, modification, coumarone, indene, carbazole, resin.

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