

Preparation of SIS-SBS modified asphalt-waterproof sheet for optimal properties

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In this study, styrene-isoprene-styrene (SIS)-styrene-butadiene-styrene (SBS) modified asphalt was prepared for waterproof-sheet to measure its properties including softening point, penetration, low temperature flexibility, viscosity and adhesion. Then the properties of SIS-SBS modified asphalt imparted with self-healing were optimized to seek for optimal compositions of SIS and SBS versus asphalt according to response surface methodology (RSM). As the content of SBS or SIS was increased, both properties of softening point and viscosity, measured at high temperature, were increased with a statistical significance. However, the increments of softening point and viscosity per unit content of SBS added, were observed to be greater than those per unit content of SIS added, respectively. It was due to the difference of thermal properties of SBS and SIS at high temperature. To the contrary, SIS-SBS modified asphalt showed a behavior of the least elasticity resulting in both the maximum of penetration and adhesion, measured at room temperature, as well as the lowest low temperature flexibility at the composition of SIS, 4 g and SBS, 8.5 g based on asphalt, 63 g.