

Modification of Asphalt Properties Using Epoxidized Natural Rubber

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Abstract

In this study the physical and reological properties of modified bitumens with epoxidized natural rubber (EPR) was investigated. Different contents of polymer, including 4, 6, 8 and 10 w%, were added to the base binder as a modifier. Also the effect of EPR on conventional properties, storage stability and reological properties of the bitumen were studied. Required tests such as penetration, storage stability, ductility, viscosity and reological analysis were conducted on prepared samples of bitumen and EPR polymer. Isocronal plots, master curves and SHRP parameters were obtained by using a dynamic shear rheometer (DSR). According to results, the storage stability of modified bitumens was depended on the EPR content of the mixture. DSR results show that the temperature susceptibility decreases by increasing the EPR content of samples. On the other according to formation of a polymeric network within the bitumen phase, viscosity and stiffness were increased and elastic behavior of the bitumen was improved. In addition, the EPR will improve rutting resistance at high temperature and thermal cracking behavior at low temperature. The optimum results were obtained for the modified sample with 6% of EPR.

Keywords: *modified bitumen, epoxidized natural rubber, rheological properties, temperature susceptibility.*