Abstract

Light colored synthetic asphalt (LCSA) binders were prepared by using aromatic oil, petroleum resin and various polymer modifiers. The polymers used included styrene-butadiene-styrene block copolymers (SBS), ethylene-vinyl acetate copolymer (EVA) and polyethylene (PE). The modification effects of single and combined polymers were investigated. Fluorescence microscopy analysis confirmed the well dispersion of polymer phase and the compatibility of the binder. Fundamental research into rheological behaviors was conducted by using viscosity test, dynamic shear rheological test and bending beam test. Test results showed that LCSA had a high viscosity at construction temperatures and strong frequency/temperature dependence on rheological properties. Polymer modification was identified by the master curves of phase angle and rheological black diagrams. BBR results demonstrated that LCSA binders were susceptible to low temperature and aging. Data analysis indicated that LCSA binders prepared by using SBS, EVA and the combination of SBS plus EVA showed considerable performance for practical application.