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ABSTRACT:

The objective of this study was to investigate the advantages and disadvantages of several linear visco-elastic rheological models applied to the unmodified and polymer-modified bitumens. It was found that all the models studied can be used to predict the linear visco-elastic of unmodified bitumens, aged and unaged samples reasonably well. In contrary, this condition was not really applicable on polymer-modified bitumens particularly for the unaged samples. The measured and predicted data was assessed using the discrepancy ratio (Ri), Mean Normalized Error (MNE) and Average Geometric Deviation (AGD) goodness of fitting statistical analysis. From the study, the modified Sigmoidal and Generalized Logistic Sigmoidal models were observed to be the most outstanding models, followed by the Christensen Anderson and Marasteanu (CAM), Christensen and Anderson (CA) and 2S2P1D (2 springs, 2 parabolic elements and 1 spring) models. The presence of semi-crystalline waves and elastomeric structures in the mixtures render the breakdown of time temperature equivalency principle.