

Characterization of Waste Thermocol Modified Bitumen by Spectroscopy, Microscopic Technique, and Dynamic Shear Rheometer

Authors : Supriya Mahida, Sangita, Yogesh U. Shah, Shanta Kumar

Abstract : The global production of thermocol increasing day by day, due to vast applications of the use of thermocol in many sectors. Thermocol being non-biodegradable and more toxic than plastic leads towards a number of problems like its management into value-added products, environmental damage and landfill problems due to weight to volume ratio. Utilization of waste thermocol for modification of bitumen binders resulted in waste thermocol modified bitumen (WTMB) used in road construction and maintenance technology. Modification of bituminous mixes through incorporating thermocol into bituminous mixes through a dry process is one of the new options besides recycling process which consumes lots of waste thermocol. This process leads towards waste management and remedies against thermocol waste disposal. The present challenge is to dispose the thermocol waste under different forms in road infrastructure, either through the dry process or wet process to be developed in future. This paper focuses on the use of thermocol wastes which is mixed with VG 10 bitumen in proportions of 0.5%, 1%, 1.5%, and 2% by weight of bitumen. The physical properties of neat bitumen are evaluated and compared with modified VG 10 bitumen having thermocol. Empirical characterization like penetration, softening, and viscosity of bitumen has been carried out. Thermocol and waste thermocol modified bitumen (WTMB) were further analyzed by Fourier Transform Infrared Spectroscopy (FT-IR), field emission scanning electron microscopy (FESEM), and Dynamic Shear Rheometer (DSR).

Keywords : DSR, FESEM, FT-IR, thermocol wastes

Conference Title : ICPEAD 2018 : International Conference on Pavement Engineering, Analysis and Design

Conference Location : Singapore, Singapore

Conference Dates : July 05-06, 2018