

Modular mobility investigation of polymer binder bitumen

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Abstract

© Published under licence by IOP Publishing Ltd. This paper is aimed to obtain polymer binder bitumen for the road applications with improved properties. Objectives included studying the degradation of crumb rubber during devulcanization in melted petroleum bitumen for its modification and resulted structural properties of bitumen. Using equilibrium swelling technique reduced density of the polymer chains was observed and analysis of sol-gel fractions showed a significant decrease in gel fraction. Under selected method of devulcanization 64% of the backbone rubber remained. With The H^1 NMR relaxation method the reduction of bitumen molecular mobility was observed due to thickening of its light fractions. The effectiveness of devulcanization was optimized using a new agent in a powder form and vacuum application. The developed binder has an improved spectrum of physical and technical properties such as softening point temperature, hardness, elasticity, frost resistance, low temperature characteristics.

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