

Towards an Understanding of Breaking and Coalescence Process in Bitumen Emulsions

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Abstract : The breaking and coalescence process in bitumen emulsion strongly influence the performance of the cold mix asphalt (CMA) and this phase separation process is affected by the physio-chemical changes happening at the bitumen/water interface. In this paper, coalescence experiments of two bitumen droplets in an emulsion environment have been carried out by a newly developed test procedure. In this study, different types of emulsifiers were selected to understand the coalescence process with respect to changes in the water phase surface tension due to addition of different surfactants and other additives such as salts. The research showed that the relaxation kinetics of bitumen droplets varied with the type of emulsifier, its concentration as well as with and without presence of salt in the water phase. Moreover, kinetics of the coalescence process was also investigated with the temperature variation.

Keywords : bitumen emulsions, breaking and coalescence, cold mix asphalt, emulsifiers, relaxation, salts

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