

タイヤ灰添加による舗装用アスファルトの紫外線劣化抑制効果

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Reducing Ultraviolet Degradation of Paving Asphalt through Tire Ash Addition

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Abstract

Ultraviolet (UV) radiation can cause serious damage to paving asphalt. Carbon black, which is known to inhibit such UV degradation, can be found in the tire ash produced by the thermal recycling of used tires. The inhibitory effect of carbon black obtained in this way was studied in this work. The asphalts examined were straight asphalt and a modified type-II asphalt. The carbon black content of the tire ash used in this study was estimated to be 14.7% based on thermal analysis and fluorescent X-ray analysis. The maximum amount of tire ash addible to asphalt was found to be 30 pha (parts per hundred asphalts). The inhibition of UV degradation was evaluated by measuring the FT-IR spectrum of the carbonyl group absorption (1710 cm^{-1}) because this absorption increases with the extent of asphalt oxidation. The results confirmed that the addition of tire ash at 30 pha lowered the intensity of the carbonyl group absorption after 3610 kJm^{-2} of UV irradiation. It was concluded that the addition of tire ash to asphalt restricts the production of carbonyl groups and inhibits UV degradation.

Key words: Paving asphalt, Ultraviolet degradation inhibitory, Tire ash, FT-IR spectra