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Effect of Silica on the Mechanical Properties of Rubber Reclaim Composite

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Abstract: This study deals with preparation of rubber composite material, which is mainly used as sport floors, especially for kindergarten grounds. The selected material is reclaim rubber that is available at the state company for tire industry in Al-Najaf city - Iraq. The reclaimed rubber (R) (as a matrix) was mixed with different ratios of other rubber that is Styrene-Butadiene (SBR). It works as a bonding material. An additive which is cement kiln dust (CKD) was employed as a reinforcement phase. The ratios of the R to the SBR was as the following (100R), (95R+ 5SBR), (90R + 10SBR), (85R + 15SBR) and (80R + 20SBR). Different ratios of the CDK (10, 20, 30, 40, 50) pphr was added for each of the above mentioned batches. (80R + 20SBR + 40CDK) batch showed a promising behaviour and therefore was selected for further investigations. In order to improve its behaviour, SiO₂ was introduced as a second additive. The silica was added to the selected batch with ratios of (5, 10, 15, 20) pphr. The best results are of the batch contains 15 pphr silica. They reveal that the resilience was 62.2% before adding the SiO₂, while it became 52.2% after adding SiO₂. In addition, the hardness was 62.5 Shore A without SiO₂ and it has been 62.3 Shore A with SiO₂. The UV influence and thermal aging will be discussed in the following pages.

Keywords : Reclaim , Silica, Reinforcement, Aging.

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