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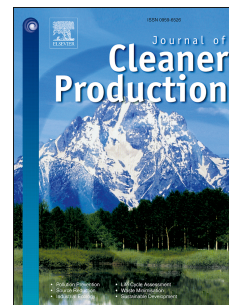
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Effect of molasses as an admixture on concrete durability

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Abstract: Every year, about half a million ton of molasses such as sugar plant wastes are produced in Turkey. Molasses was begun to use as mid-range plasticizer thanks to its water reducing properties. The fact that normal plasticizers are not able to reduce sufficient water since to increase in their strength caused mid plasticizers to become common. Usage of an organic substance such as molasses in concrete should be studied in terms of its behavior against such chemical effects as acid and sulphate. To this end, pure molasses and molasses with formaldehyde (to prevent fermentation) were added to concrete mixtures at the rates 0.5% and 1%. First, the effect of molasses on fresh and hardened concrete properties was established, then, additional specimens were obtained during production for strength tests and were cured in acid and sulphate solutions for 28, 56, 90, and 180 days. Ultrasonic pulse and compression tests were conducted on specimens exposed to harmful chemical effects, and final losses were also established. In addition, mortar bar specimens were kept in acid and sulphate solutions after the process changes in their lengths were measured. The effect of molasses on alkali-silica reaction was established depending on the length changes of mortar bar specimens. Behaviors of mixtures obtained by adding the same amounts of polymeric sulphonate-based admixtures used as mid-range plasticizers under chemical effects were compared with admixtures containing molasses. Concretes with molasses were observed as affected from the harmful chemical reactions more compared to control concretes. Concrete cost can be reduced by using molasses that also provides a green production.

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