بيانات عن بحث (7) مقدم للترقية

Evaluation of date kernel powder (DKP) for potential use as setting and hydration retarder in concrete

The setting time of concrete is a major determinant of its workability. Increasing the water- binder ratio leads to improve workability, but concomitantly reduces the strength of concrete. Retarding admixtures are generally used to delay the setting time of concrete, especially in hot weather. Date kernels is one of the major waste product generated in Saudi Arabia and Middle east and utilization of date kernel powder (DKP) in concrete and other applications have been investigated with limited success. In this paper, results of an experimental investigation conducted to evaluate the potential of DKP as a setting retarder in concrete are presented. The cement was replaced by DKP at different replacement levels (0.5%, 1%, 2%, 3%, 4% and 5%) and different dosages of the commercial retarder were used (0.2%, 0.4%, 0.6%, and 0.8%). The effect of DKP and the commercial retarder on heat of hydration, thermal properties (thermal conductivity, resistivity and specific heat capacity), slump, density, compressive and tensile strength, and ultrasonic pulse velocity were investigated. The results showed that DKP had a significant effect on delaying the initial and final setting time of concrete and decreasing the evolution of heat of hydration and peak temperature when the DKP replacement quantities increased. However, the replacement of cement with DKP at a dosage greater than 2% resulted in a significant decrease in the compressive and tensile strength of the concrete. The density of the DKP concrete, thermal conductivity, specific heat capacity, and ultrasonic pulse velocity also decreased with increasing DKP dosage. The commercial retarder, on the other hand, had no significant effect on any of the measured properties.