

Study of albumen as foaming agent for use in self-healing high strength concrete

Abstract

Self-healing is an effective solution for sustainable maintenance for concrete to increase its durability against to sensitivity of cracking. As recently, the method of introducing bacterial agent in concrete were modified because of harsh environment in concrete such as small size of pore which cause squeezing of bacteria. In this research, the albumen from egg was used as foaming agent to create voids in concrete matrix. The aerated concrete matrix offer voids to bacteria as concrete will become dense and bacteria would squeezed during hydration process. The effect of albumen as foaming agent in concrete was studied while achieving the high strength aerated concrete type towards its compressive strength, splitting tensile strength and study the voids dissolution (visual) in concrete matrix when incorporation of albumen as foaming agent. The albumen of 2%, 4% and 6% is used as foaming agent (FA) to produce the high strength aerated concrete (HSAC). After 28 days of curing, the compressive and splitting tensile strength of HSAC reduced with the increased of albumen used in concrete. The highest compressive and splitting tensile strength of HSAC were 95.40 MPa and 6.67% respectively with 2% FA in comparison to control. The results of water absorption of HSAC also decreased when higher concentration of albumen used. The sizes of voids created in all samples were less than 15 mm. It can deduced that 2% of foaming agent was ideal to produce optimum characteristics in strength, uniform and size of voids in high strength aerated concrete.