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Study on the Preparation and Properties of a Novel Photocatalytic Foam Concrete

Fu Shifeng[1,2], Zhang Guangtian[3,4], Song Yang[5]

1 School of Civil Engineering, Hebei University of Technology, Tianjin 300401,China;
2 Hebei Academy of Building Research, Shijiazhuang 050021,China;
3 College of Civil and Environmental Engineering, University of Science and Technology Beijing,Beijing10083,China;
4 Hebei Institute of Technology Co., Ltd.,Shijiazhuang,050021, China;
5 Hebei University of Water Resources and Electric Engineering, Cangzhou, 061001, China

Abstract: The preparation method of the new type of foam concrete board was studied. The influence of different amount of fly ash on the compressive strength, water absorption and thermal conductivity of foamed concrete was studied. The experimental results show that under the same bulk density, the 28 day compressive strength of foamed concrete increases with the increase of the content of fly ash, and the compressive strength is the highest when the amount of fly ash is 30%, and the strength of the case of the larger design weight is smaller. And the water absorption rate is as the increase of the amount of fly ash and the overall tends to decline, and in the design of bulk density of 600 kg•m-3, water cement ratio is 0.42, the amount of fly ash is 30%, the water absorption rate of foam concrete. The thermal conductivity of foamed concrete has no obvious effect on the thermal conductivity, which can reduce the thermal conductivity of concrete, and the minimum thermal conductivity is 0.55 w•(m•K)-1. the influence of different dosage of silica fume, water absorption, thermal conductivity, different dosage and different time on the degradation rate is discussed. The results show that, with the increase of silica fume, the compressive strength of foamed concrete is increased by 28 days, and the strength of foamed concrete can be improved by 10%. And the water absorption rate of the whole tends to decrease with the increase of the amount of silica fume, and the water absorption rate of foamed concrete is greatly reduced when the amount of silica fume is 10%. When mixed with 10%, the thermal conductivity of concrete is reduced, the thermal conductivity of the concrete is 0.62 w / (m·K). The degradation rate increased with the increase of the amount of titanium dioxide, and the degradation rate was 96% in 80 hours

when the amount of nano-TiO2 was 0.9. In the specimen curing time, the shorter the spraying time, the better the degradation rate.

Keywords: fly ash; foam concrete; photocatalysis; nano-TiO2