Effect of redox state of iron on properties of basalt fiber

Qingwei Wang*†[1], Lida Luo[2], and Qian Ma[2]

[1]donghua university – China
[2]donghua university – China

Abstract

Basalt fiber with high strength, good temperature resistance and chemical resistance and other properties, are widely used in reinforced concrete and other composite materials. Basalt fiber was manufactured with natural basalt rock from China, and measured by XRD, SEM, XRF, fiber strength tester and visible spectrophotometer. The concentration of two different valence iron oxide were changed though adding oxidation agents or reduction agents in the condition of keeping the same total iron concentration. the influence of the redox state of iron on mechanical property of basalt fiber was studied. The result show, the tensile strength of fiber was increasing respectively by 30.56% when the redox state of iron dropping to 0.26. While the index rise to 0.80, the strength was decreased by 10.42%. It is inferred that ferric oxide is beneficial to improve basalt fiber performance as a network form.

Keywords: Basalt fiber, Redox state of iron, Tensile strength, Glass network

*Speaker
†Corresponding author: wqwq888@dhu.edu.cn