

Physical Properties of Alkali Resistant-Glass Fibers in Continuous Fiber Spinning Conditions

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Abstract : In this study, a glass fiber is fabricated using a continuous spinning process from alkali resistant (AR) glass with 4 wt% zirconia. In order to confirm the melting properties of the marble glass, the raw material is placed into a Pt crucible and melted at 1650 °C for 2 h, and then annealed. In order to confirm the transparency of the clear marble glass, the visible transmittance is measured, and the fiber spinning condition is investigated by using high temperature viscosity measurements. A change in the diameter is observed according to the winding speed in the range of 100-900 rpm; it is also verified as a function of the fiberizing temperature in the range of 1200-1260 °C. The optimum winding speed and spinning temperature are 500 rpm and 1240 °C, respectively. The properties of the prepared spinning fiber are confirmed using optical microscope, tensile strength, modulus, and alkali-resistant tests.

Keywords : glass composition, fiber diameter, continuous filament fiber, continuous spinning, physical properties

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