HYDROFOBIC COATING FOR GLASS WITH SOL GEL METHOD BASED ON WATER GLASS

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ABSTRACT

The research of hydrophobic coating for glass with sol gel method based on water glass had been done. This paper proposed the technique of hydrophobic sol gel silica coating on the glass and the condition for conditioning hydrophobic silica sol on the glass. In this experiment, water glass was diluted in water 60°C then it cooled at room temperature and passed through the caution resin to produced silicic acid (pH = 2). Glass substrate was dipped in silicic acid with various of drawing speed then aging at room temperature for 10 hours. Substrate was dipped in methanol for an hour and dipped in surface-modifying agent (HMDS and TMCS) with various operating conditions. Final step, substrate was dried for 2 hours. This research showed that drawing speed and concentration of water glass had no effect to the contact angle. The increasing contact angle was depend on how high the concentration and temperature of surface-modifying agent and also duration of immersion in the surface-modifying agent. The best result was obtained with 7.5 cm/min for the drawing speed, 9.7 M in 50°C for TMCS concentration with duration of immersion seven hours and 5.6% weight for water glass concentration with contact angle was 142.5°. For transparency level, duration of
immersion in surface-modifying agent, temperature of surface-modifying agent and concentration SiO$_2$ caused decreasing transparency level of glass. Overall transparency level of glass was 93.5%, relative with transparency of substrate without coating.

**Keywords:** Water glass, sol gel, hydrophobic, and surface modification