

Synthesis and characterization of Y-PVB : Increase of thermal, mechanical stabilities and light transmittance property

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Y-polyvinyl butyral copolymer was prepared by precipitation method from the acetalization of polyvinyl alcohol and 2-methyl butylaldehyde and it was structurally, morphologically and optically characterized by FT-IR, XRD and SEM, UV-Vis investigation. In H-NMR and FT-IR analysis, the resulting copolymer from hydrolysis and acid condensation shown successful synthesis. TGA and DSC analysis showed Y-polyvinyl butyral has better thermal stability than that of pristine polyvinylbutyral, This was due to increasing the content of acetals raise an increase in hydrogen bonding and leads to an increase of the polymer Tg. Y- polyvinyl butyral also gave very excellent optical transparency and good adhesion properties to the glass material. Broad peak in WAXD confirms that Y- polyvinyl butyral is semicrystalline in nature. UV-Vis result showed polyvinyl butyral has higher than 91% transmittance and this predicted that transmittance depends on not polymer but glass adherend. T-peel tests for four testing group were taken place according to ASTM D1876 and strength showed min 9.5N to max 22.8N . Higher mole fraction of 2-methylbutyl aldehyde also affected low water sorption rate.