

## ABSTRACT

Due to limited availability and toxicity of petrochemicals, renewable and bio-based materials are used for sustainable production of bio adhesives. Hemicellulose is one of such biomaterials that incorporate in enhancing and reinforcing properties of adhesive. To investigate the properties of hemicellulose as laminating adhesive. Blending hemicellulose and polyvinyl alcohol in water. Further a cross linking agent citric acid at 0.1%, 0.2%, 0.3%, 0.4%, 0.5% concentration was added to modify this blend for enhancing properties. Acetal bond was formed between hemicellulose and PVA by cross-linking of free hydroxyl groups as shown from Fourier-transform infrared (FTIR) spectroscopy, Differential scanning calorimetry (DSC) to analyze glass transition temperature, Thermal gravimetric analysis (TGA), enhancement in mechanical properties by tensile shear strength, solid content, gel time determination, pH and viscosity, contact angle measurement, moisture content after 24 hr water vapor transmission rate (WVTR) showed excellent results. Citric acid as a cross linker showed the enhancement in thermo-mechanical and adhesion properties.