

MODIFICATION OF INSECT SECRETION ON KESAMBI TREE BY USING ANHYDRIDE PHTHALIC AS BIOBASED MATERIAL ALTERNATIVE FOR MATRIX OF COMPOSITE

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ABSTRACT

This study was division of research road *map* "Preparation of biocomposite from natural matrix matlac with reinforcement of natural fiber". Matlac is produced by engineer insect secretion toward matrix of composite. The objective of this research was to modification of matrix Matlac with adding anhydride phthalic with the result that its properties is more better than before modification. The adding anhydride phthalic 5, 10, 15, 20, and 25 % respectively is expected can increase tensile strength of matrix matlac. Secretion of lac insect was used as matrix lac (matlac). The first step, matrix phase was changed from solid to liquid with using an ethanol p.a. as a solvent by mass ratio of matlac-solvent in composition 1:2, so the matrix distributed homogenly. Secondly, matlac was modified by adding anhydride phthalic with concentration 5, 10, 15, 20, and 25 % respectively. Polymerization was conducted at 50⁰C with agitation during 2 hours. Thirdly, matrix matlac of insect secretion without and with modification are characterized by intrinsic viscosity analysis with using viscometer Ostwald, functional group analysis with using FTIR spectrophotometer, thermal properties analysis with using Differential Thermal – Thermogravimetric Analyzer, and crystallinity with using X-Ray Diffractometer. The result of this research showed that matrix matlac from secretion of lac insect on Kesambi tree as matrix of composite can be modified by reaction with anhydride phthalic at 50⁰C with agitation during 2 hours. Functional group analysis showed that the modified matlac had functional groups i.e. -OH, CH methylene, C=O ester, and C-O. Modified matlac has functional group ester and hydroxyl groups. The resulting matrix has a chain length changes. The addition of phthalic anhydride into the matrix of the secretion of lac (matlac) caused the emergence of the benzene ring from phthalic anhydride. Modified matrix matlacs of secretion shellac have very high yield between 98.52% to 100%. The addition of phthalic anhydride 5% can produce matlac matrix with high viscosity of 104.4 mL/g and the highest thermal stability as well. Matlac matrix modification by the addition of phthalic anhydride 5% and 25% had DTA and TGA thermogram pattern was almost the same. The addition of phthalic anhydride at a concentration of 5% and 25% can cause decreasing crystallinity

KEYWORDS: Aleuritic Acid, Anhydride Phthalic, Matlac Matrix, Secretion of Lac Insect on Kesambi Tree