

SIFAT KIMIA KAYU MAHONI SETELAH PERLAKUAN PANAS PADA BERBAGAI VARIASI SUHU DAN METODE

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INTISARI

Kayu mahoni merupakan salah satu jenis kayu yang digemari oleh masyarakat Indonesia. Kayu mahoni hutan rakyat umumnya mempunyai kualitas relatif rendah karena kurangnya tindakan pemeliharaan dan pemanenan usia muda. Perlakuan panas dikenal sebagai metode modifikasi kayu yang dapat meningkatkan kualitas kayu. Perlakuan panas pada kayu dapat menurunkan higroskopisitas, meningkatkan stabilitas dimensi dan keawetan kayu, menyeragamkan warna, namun mengakibatkan penurunan sifat mekanika dan wetabilitas kayu. Perubahan sifat fisika dan mekanika akibat perlakuan panas tersebut mengindikasikan adanya perubahan pada sifat kimia kayu. Oleh karena itu, tujuan penelitian ini adalah mengetahui pengaruh interaksi suhu dan metode perlakuan panas terhadap sifat kimia mahoni.

Bahan baku penelitian ini adalah kayu mahoni berukuran 2cmx2cmx20cm yang berasal dari hutan rakyat yang telah mengalami perlakuan panas dengan metode oven dan *steaming* pada variasi suhu 90°C, 120°C, dan 150°C selama 2 jam waktu efektif. Sifat-sifat kimia yang diuji adalah kadar holoselulosa, alfa selulosa, pentosan, lignin, ekstraktif (larut air dingin, alkohol-benzena, air panas), kelarutan dalam NaOH 1%, dan nilai pH mengacu pada ASTM.

Hasil penelitian menunjukkan bahwa interaksi suhu dan metode perlakuan panas memberikan pengaruh yang sangat nyata terhadap kadar pentosan (9,23-18,42%), juga berpengaruh nyata terhadap kadar ekstraktif larut air panas (1,28-2,04%). Faktor suhu perlakuan panas berpengaruh sangat nyata pada kadar holoselulosa (53,39-71,67%), alfa selulosa (34,97-40,59%), hemiselulosa (17,02-31,08%), lignin (17,69-35,48%), ekstraktif (air dingin (3,73-7,36%) dan alkohol-benzena (6,90-13,12%)), kelarutan dalam NaOH 1% (21,13-24,84%) dan nilai pH (4,43-6,33). Persentase penurunan kadar holoselulosa, alfa selulosa, hemiselulosa dan nilai pH seiring dengan naiknya suhu perlakuan panas berturut-turut mencapai 15,23%; 11,53%; 17,41%; dan 19,83%, sedangkan peningkatan kadar lignin, dan kelarutan dalam NaOH 1% mencapai 54,43% dan 21,97%. Faktor metode perlakuan panas berpengaruh sangat nyata terhadap kadar holoselulosa, lignin, ekstraktif larut air dingin, ekstraktif larut alkohol-benzena, dan nilai pH. Metode oven menghasilkan contoh uji dengan kadar holoselulosa, ekstraktif larut air dingin dan nilai pH lebih tinggi dengan rerata berturut-turut sebesar 65,78%; 6,24%; dan 6,16% dibandingkan dengan metode *steaming*.

Kata kunci: *Swietenia* sp., perlakuan panas, oven, *steaming*, suhu, sifat kimia

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MAHOGANY CHEMICAL PROPERTIES AFTER HEAT TREATMENT AT VARIOUS TEMPERATURE AND METHOD

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ABSTRACT

Mahogany is one of favorite timber by Indonesian people. Mahogany from community forests generally have relatively low quality due to lack of maintenance activities and young harvesting stage. Heat treatment is known as wood modification method that could improve the quality of the wood. Heat treatment can reduce hygroscopicity, increase dimensional stability and durability of the wood, color uniformity, although its resulted in decreasing mechanical properties and its wettability. Changes in physical and mechanical properties due to heat treatment indicates a change in the chemical properties of wood. Therefore, the aim of this study was to determine the interaction effect of temperature and method of heat treatment on the chemical properties of mahogany.

Materials used in this research were mahogany woods (2cmx2cmx20cm) from community forest which were heat-treated using oven and steam methods performed at temperature of 90°C, 120°C, and 150°C for two hours of effective time. In this research, some chemical changes were analyzed such as the contents of holocellulose, alpha cellulose, pentosan, lignin, cold-water solubility, alcohol-benzene extractives, hot-water solubility, 1% NaOH solubility, and pH value according to the ASTM.

Result of the research showed that the interaction of temperature and heat treatment method gave a significant influence on pentosan (9.2-18.42%), and hot-water extractive solubilities (1.28-2.04%). Temperature factor significantly affected the content of holocellulose (53.39-71.67%), alpha cellulose (34.97-40.59%), hemicellulose (17.02-31.08%), lignin (17.69-35.48%), cold-water (3.73-7.36%) and alcohol-benzene extractives (6.90-13.12%), 1% NaOH solubility (21.13-24.84%), and pH value (4.43-6.33). The percentage decreasing in the content of holocellulose, alpha cellulose, hemicellulose, pH values with the increasing temperature of heat treatment were about 15.23%; 11.53%; 17.41%; and 19.83%, whereas increasing lignin content and solubility in 1% NaOH were 54.43% and 21.97%, respectively. Heat treatment factor significantly affected on the content of holocellulose, hemicellulose, lignin, cold-water and alcohol-benzene extractives, and pH value. Oven heating provided in higher content of holocellulose, cold-water solubility, and higher pH values which its average were 65.78%, 6.24% and 6.16% respectively, compared to the steaming heating.

Key words : *Swietenia* sp., heat treatment, oven, steaming, chemical changes

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