Environmental Engineering and Management Journal

November 2024, Vol. 23, No. 11, 2327-2340
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu
http://doi.org/10.30638/eemj.2024.187

"Gheorghe Asachi" Technical University of Iasi, Romania

INFLUENCE OF ENVIRONMENTAL FACTORS ON THE PERFORMANCE OF WOOD COATING SYSTEMS

Andreea Mihailă[1], Alina-Mirela Ipate[2], Mirela-Fernanda Zaltariov[2], Daniela Rusu[2], Roxana Constantinel[1], Gabriela Lisa[1*]

[1]"Gheorghe Asachi" Technical University, Faculty of Chemical Engineering and Environmental Protection "Cristofor Simionescu", 73 Prof. D. Mangeron Blvd., 700050 Iaşi, Romania
[2]Petru Poni Institute of Macromolecular Chemistry, 41A Aleea Gr. Ghica Voda, 700487 Iasi, Romania

Abstract

Lacquers are widely sold coating products, purchased globally in large quantities by both industrial and domestic consumers. They are commonly used to protect and color wood surfaces.
In this study were considered two categories of products used for non-industrial scopes to protect any wood surface which can be found inside or outside of a house. The acrylic impregnate, a water-based product, penetrates wood fibers, helping to delay or even prevent the action of microorganisms. The alkyd lacquer is the product which, after drying, ensures the formation of a glossy film and a long-lasting protection. The influence of the number of coating layers and the influence of the action of environmental factors were evaluated through exposure in four climatic zones for 18 months. The characterization techniques applied were: thermogravimetric analyzes (TGA), water contact angle value determination, energy-dispersive X-ray spectroscopy (EDX) and Attenuated Total Reflection Fourier Transform Infrared (ATR-FTIR) spectroscopy.

Key words: ATR-FTIR spectroscopy, C/O ratio, energy-dispersive X-ray spectroscopy, N/C ratio, thermal stability, water contact angle, wood protection

Received: June, 2024; Revised final: October, 2024; Accepted: October, 2024; Published in final edited form: November, 2024

* Author to whom all correspondence should be addressed: e-mail: gabriela.lisa@academic.tuiasi.ro