

Polymeric reaction between aldehyde group in furfural and phenolic derivatives from liquefaction of oil palm empty fruit bunch fiber as phenol-furfural resin

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ABSTRACT

Resinification of liquefied empty fruit bunch with furfural (LEFB-Fu) was performed. During the resinification process, the samples were taken every hour up to 4 hours. FTIR analysis of the samples was conducted to understand the progress of the reaction. It showed that the bands of 1512 cm^{-1} and 1692 cm^{-1} evolving and diminishing respectively, indicating the consumption of furfural. The postulation of polymerization was also proven as the increasing extent of substitution of aromatic ring observed.

KEYWORDS

FTIR; Furfural; Phenol; Resin

REFERENCES

1. Formaldehyde Standards for Composite Wood Products, Act VI, Congress of the United States of America, WA, USA, 2010.
2. Formaldehyde, Concise International Chemical Assessment, World Health Organization (WHO), Geneva, 2002.
3. J. Chang, Z. Guo, R. Fortmann, H. Lao, Characterization and reduction of formaldehyde emissions from a low-VOC latex paint, *Indoor Air* **12** (2002) 10-16. <https://doi.org/10.1034/j.1600-0668.2002.120103.x>
4. G.E. Myers, Advances in methods to reduce formaldehyde emission, in: M.P. Hamel (Ed.), *Composite Board Products for Furniture and Cabinets: Innovations in Manufacture and Utilization*, Forest Products Research Society, New York, USA, 1989, pp. 58–64.
5. Furfural: Future Feedstock for Fuels and Chemicals, *biomassmagazine.com*. 2016.