

**Effect of the combinatorial treatment with *Pseudomonas fluorescens* esterase and supercritical water on catechol production from Kraft lignin**

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Catechol is consumed in the production of pesticides and used as a precursor to flavors, perfumes and pharmaceuticals. A novel hybrid method, combining the peracetic acid (PAA) produced from mutant *Pseudomonas fluorescens* esterase (PFE) with the supercritical water (SCW) treatment was used to enhance catechol production from Kraft lignin. After optimization of PFE reaction & SCW treatment, the combinatorial treatment was conducted. The degraded lignin analyzed using GPC had a high molecular peak with an  $M_p$  (peak molecular weight) of about 650 g/mol, which was lower than the  $M_p$  (3000 g/mol) of raw Kraft lignin. Also there was no effect of PAA in the SCW-treated lignin. But new product that was nonexistent in sole SCW treatment was detected in PFE and SCW in reversed sequence by GC-MS. This synergistic effect of co-treatment occurred in production of catechol and led to reduction in the SCW reaction time to 10 min. This hybrid method is useful for enhancing the degradation of Kraft lignin and the catechol production.