Supplementary information

Chemical synthesis of β-O-4 type artificial lignin

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**Synthesis of compound 3**  Compound 1 (2.58g) (*J. Chem. Soc., Perkin 1*, 1998, 3207-3217) was acetylated with acetic anhydride/pyridine (1:1, v/v, 12 ml) at room temperature for 20 h to afford compound 2 (2.63g). To a stirred slurry of LiAlH₄ (1.1g) in anhydrous THF (20 ml), compound 2 (2.63g) in anhydrous THF (20 ml) was added dropwise over 30 min at 50 °C. After 30 min, the reaction mixture was quenched with 85% aqueous THF (10ml), and then water was added to the reaction mixture until a gelatinous precipitate was observed. The precipitated aluminum salts were filtered off and the reaction mixture was diluted with ethyl acetate, washed with brine, dried over anhydrous Na₂SO₄ and concentrated to dryness *in vacuo* to afford crystals (2.03g). ¹H-NMR (CDCl₃) (acetate): δ 2.00-2.31 (m, 2H, Cβ-H), 2.03, 2.06 (s, 6H, OCOCH₃), 3.90 (s, 3H, OCH₃), 3.96-4.19 (m, 2H, Cγ-H ), 5.14 (s, 2H, OCH₂Ph), 5.79 (dd, 1H, J = 6.2, 7.8, Cα-H), 6.83-6.87, (3H, aromatics), 7.29-7.44 (5H, aromatics).
Fig. $^1$H-NMR spectral data for acetylated β-O-4 type dimer model compound (Acta Chemica Scandinavica B, 1986, 40, 31-35.). e: erythro, t: threo.