# Structural Variation of Lignin and Lignin-Carbohydrate Complex in Eucalyptus grandis $\times \mathrm{E}$. urophylla during Its Growth Process <br> Zhao, Bao-Cheng; Chen, Bo-Yang; Yang, Sheng; Yuan, Tong-Qi; Charlton, Adam; Sun, Run-Cang 

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## Figure Captions

Scheme 1. Synthesis diagram of lignin-based adsorbent.
Fig. 1. ${ }^{31} \mathrm{P}-\mathrm{NMR}$ spectra of the L and PL. Abbreviations: CS, condensed syringyl phenolic hydroxyls; S, non-condensed syringyl phenolic hydroxyls; CG, condensed guaiacyl phenolic hydroxyls; G, non-condensed guaiacyl phenolic hydroxyls; H, p-hydroxybenzoate phenolic hydroxyls; COOH , carboxylic groups.

Fig. 2. ${ }^{1} \mathrm{H}$ NMR spectra of the lignins.
Fig. 3. The ${ }^{13} \mathrm{C}$ NMR spectra of the lignins.
Fig. 4. The effect of the pH on the adsorption capacity (a) and the zeta of SAPL-1.5 (b).

Fig. 5. The effect of SAPL-1.5 dosages on the adsorption capacity and removal efficiency.

Fig. 6. The effect of initial Pb (II) concentration on the adsorption capacity and removal efficiency (a), and the Langmuir and Freundlich isotherm models investigated (b).

Fig. 7. The effect of contract time on the adsorption capacity (a), and the Langmuir and Freundlich isotherm models investigated (b).



Scheme 1


Fig. 1.


Fig. 2.


Fig. 3.


Fig. 4.


Fig. 5.


Fig. 6.



Fig. 7.


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