

## Supplementary information

### **Ionic Polymer-Coated Laccase with High Activity and Enhanced Stability: Application in the Decolourisation of Water Containing AO7**

Xiaolin Zhang, Ming Hua, Lu Lv & Bingcai Pan\*

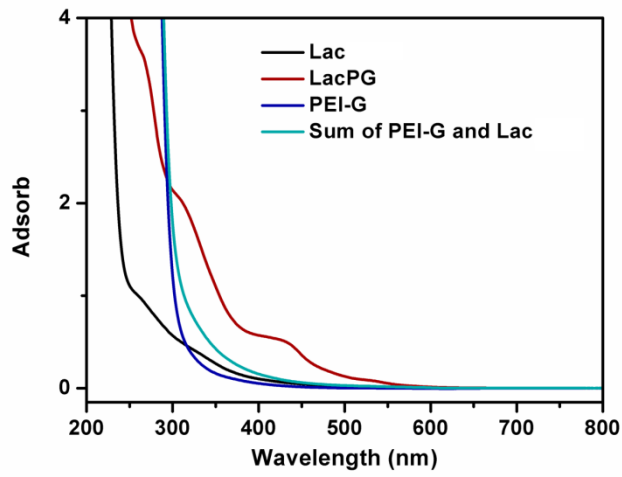
State Key Laboratory of Pollution Control and Resource Reuse, School of the Environment,  
Nanjing University, Nanjing 210023, P.R. China

\*To whom correspondence should be addressed

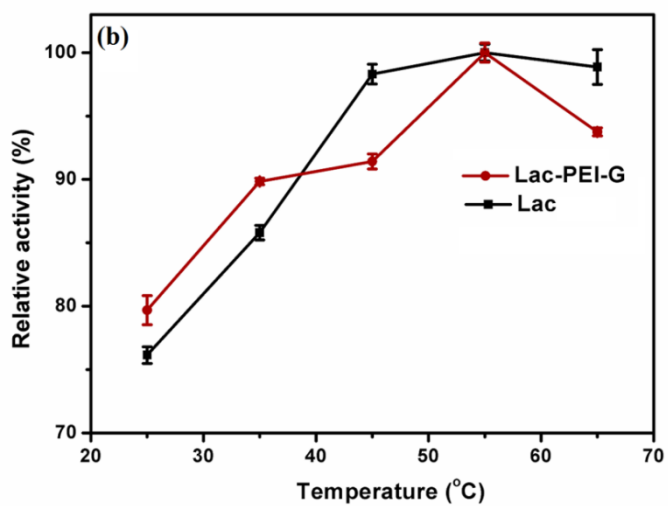
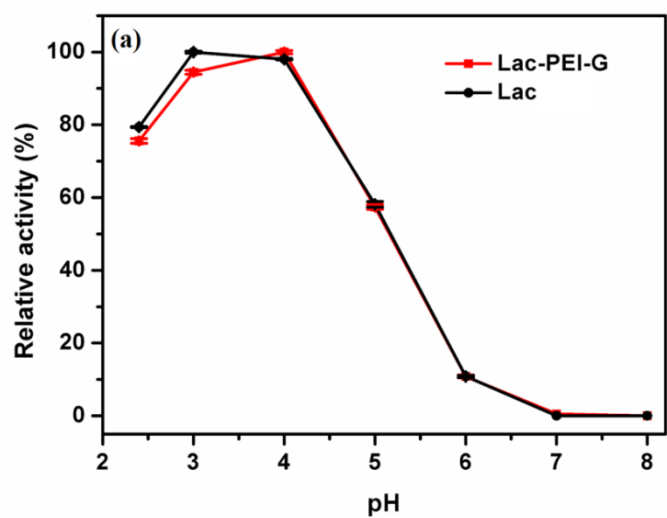
E-mail: [bcpan@nju.edu.cn](mailto:bcpan@nju.edu.cn) (B.C.P.)

Tel: +86-25-8968-0563

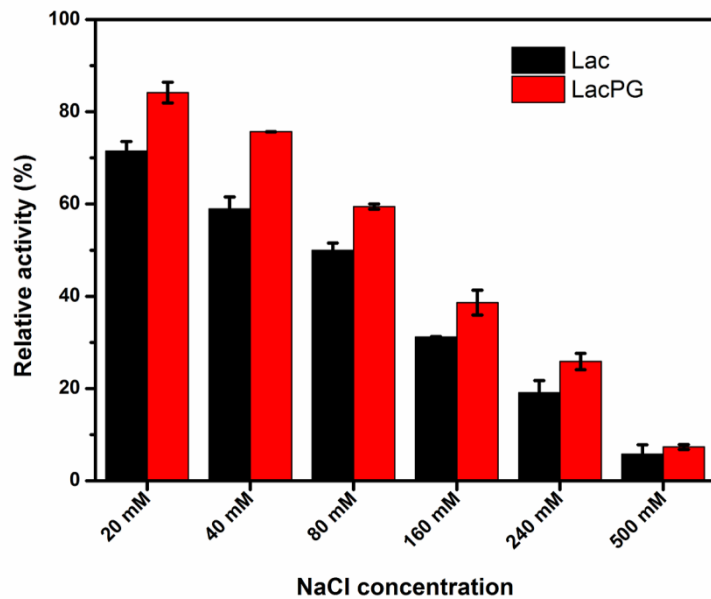
The *Supplementary Information Available* contains 10 pages, including  
Figures S1-S9.



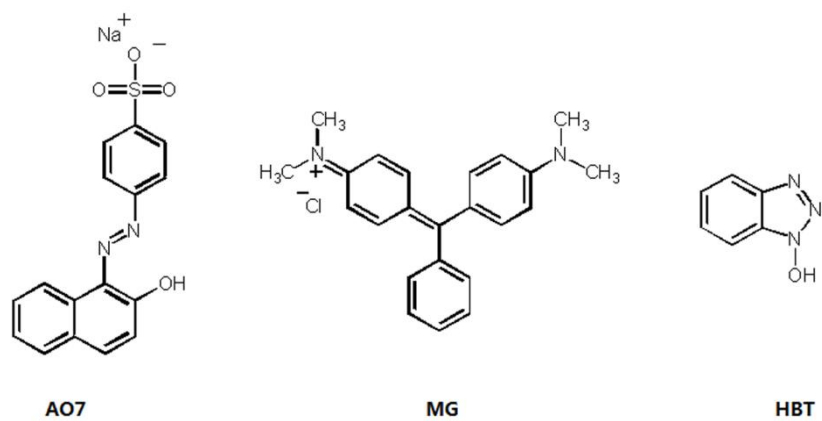
**Figure S1.** UV-vis spectra of Lac, LacPG, PEI-G dissolved in phosphate buffer solutions (pH 7.0, 0.05 M); the concentrations of corresponding components were: 1 mg/mL laccase protein, 0.05% PEI (w/v) and 0.05% GA (v/v).



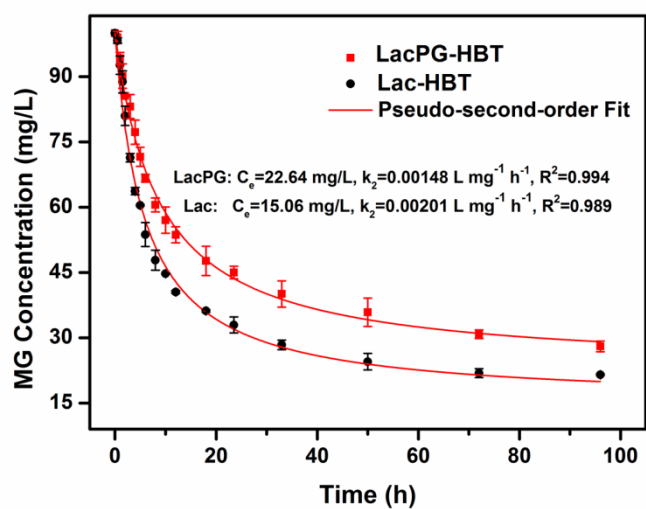
**Figure S2.** The effects of pH (a, at 25 °C) and temperature (b, at pH 5.0) on the activity of Lac and LacPG; error bars represents standard deviations from triplicate measurements.



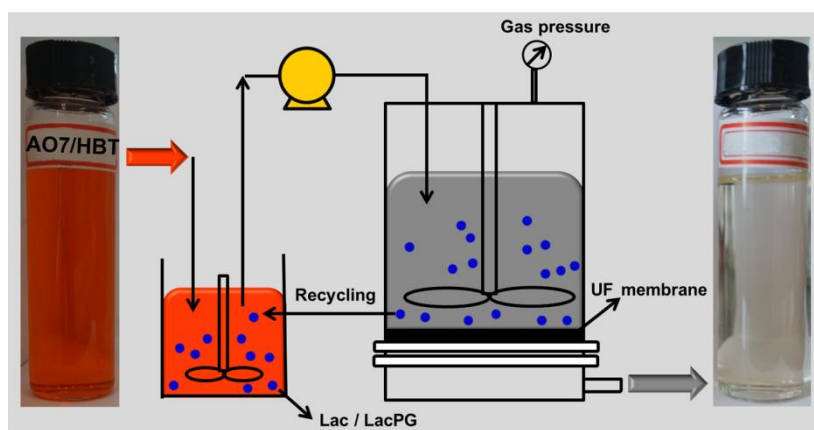
**Figure S3.** The effects of the concentration of chloride ions on the activity of Lac and LacPG; error bars represents standard deviations from triplicate measurements.



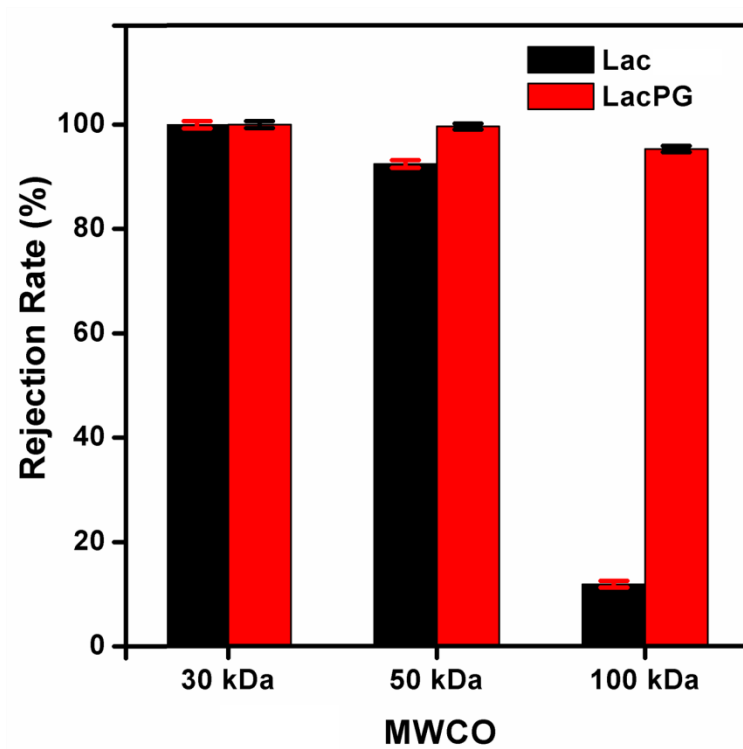
**Figure S4.** The schematic structures of AO7, MG and HBT in this study



**Figure S5.** Decolourisation of MG using Lac and LacPG in presence of HBT (pH 5.0, 25 °C); error bars represent standard deviations from triplicate measurements.

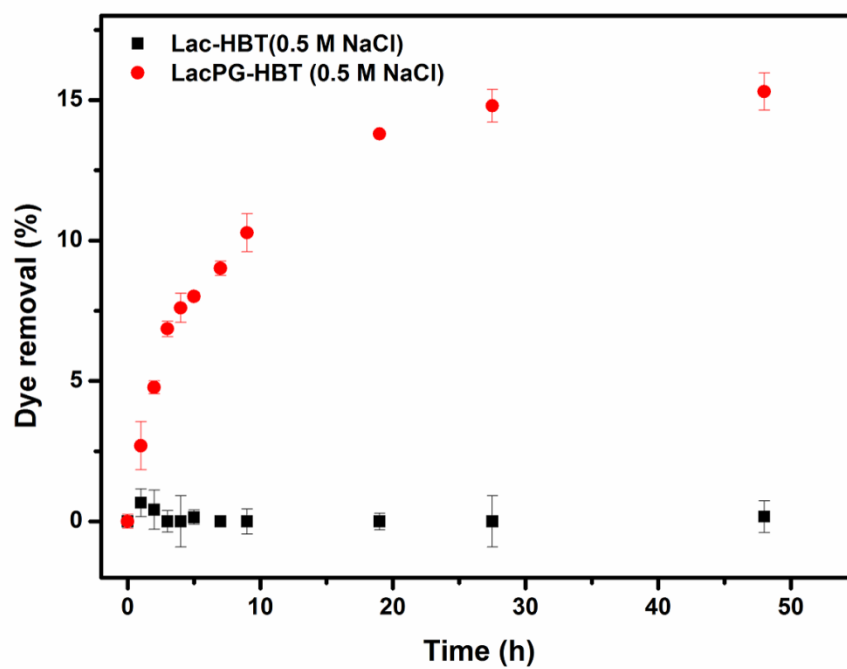


**Figure S6.** Schematic illustration of the enzymatic membrane reactor for cyclic AO7 decolourisation.

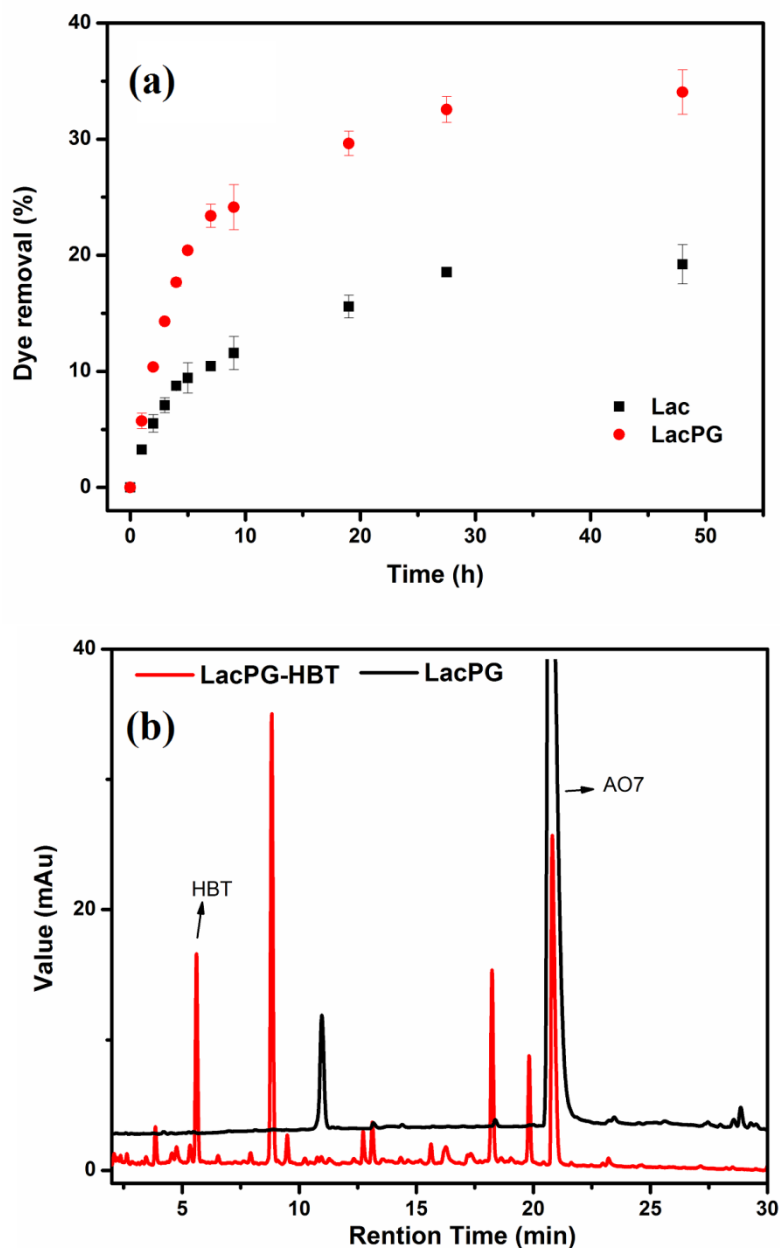


**Figure S7.** The rejection of Lac and LacPG separated by ultrafiltration membrane with different MWCO (25 °C, pressure=0.1 MPa)





**Figure S8.** Decolourisation of AO7 containing 0.5 M NaCl using Lac and LacPG in presence of HBT (pH 5.0, 25 °C); error bars represent standard deviations from triplicate measurements.



**Figure S9.** Decolourisation of AO7 using Lac and LacPG in presence and in absence of HBT (pH 5.0, 25 °C) (a) and metabolite of AO7 degraded by LacPG in presence and in absence of HBT monitored by HPLC at 254 nm (b); error bars represent standard deviations from triplicate measurements.