**Electronic Supplementary Information** 

## **Eco-friendly preparation and characterization of high-performance**

## electrothermal graphene-AgNPs/lignocellulose composites

Furong Liu, Cuiping Yu,\* Xinyi Guo, Hui Peng, Shengqiang Qiu\*

Hunan Provincial Key Laboratory of Water Treatment Functional Materials, Hunan Province Engineering Research Center of Electroplating Wastewater Reuse Technology, College of Chemistry and Materials Engineering, Hunan University of Arts and Science, Changde 415000, PR China.

\* Corresponding author: Cuiping Yu, Shengqiang Qiu.

E-mail address: cpyu2018@huas.edu.cn (C. P. Yu), qshq915@163.com (S. Q. Qiu).



Fig. S1 Digital photos of the sample test setup for Gr-AgNPs/LCF composite films. The effective heating area of the electrothermal films used for testing was about 2 cm $\times$ 2 cm.



Fig. S2 A high-resolution XPS spectrum of Ag 3d.



**Fig. S3** Size distribution of AgNPs deposited on Gr surface. Inset: SEM micrographs of Gr-AgNPs/LCF composite films.



**Fig. S4** The relationship between temperature and time of 20 wt.% Gr-AgNPs/LCF composite film running with 7 V. Inset: Infrared thermal imaging of the 20 wt.% Gr-AgNPs/LCF electrothermal film during the heating process at a driving voltage of 7 V.