

## Supporting information

### Activated carbon prepared by co-pyrolysis of waste tobacco straw and waste LDPE mulch film: Characterization and application for methylene blue removal

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#### Thermogravimetric experiments

Thermogravimetric analysis (TGA) was carried out using a thermal analyzer (TGA/DSC2, Switzerland). TGA experiments were conducted on 9 mg samples in inert atmosphere (N<sub>2</sub>), using a ramp rate of 10 °C/min, to the final temperature of 900 °C.

#### Results and discussion

Derivative thermo-gravimetric (DTG),  $-\frac{d\alpha}{dt}$ , curves for individual feedstock and the blend are shown in Fig. S1. It can be clearly seen that the weight loss of tobacco straw occurred mainly in the temperature range 180-510°C, with a maximum weight loss of 0.0087 °C<sup>-1</sup> at 319°C. The decomposition of LDPE occurs mainly at temperatures of 400 - 500°C, with a maximum weight loss rate of 0.0297°C<sup>-1</sup> at 478°C. The overlap of the tobacco straw and LDPE pyrolysis temperature regimes provides the necessary conditions for interactions to occur. Compared to the theoretical results (0.00435 °C<sup>-1</sup>), co-pyrolysis (Fig. S1(c)) increased the maximum weight loss in the first stage. At the same time, the maximum weight loss rate of the second stage decreased compared to the theoretical value (0.01485 °C<sup>-1</sup>).

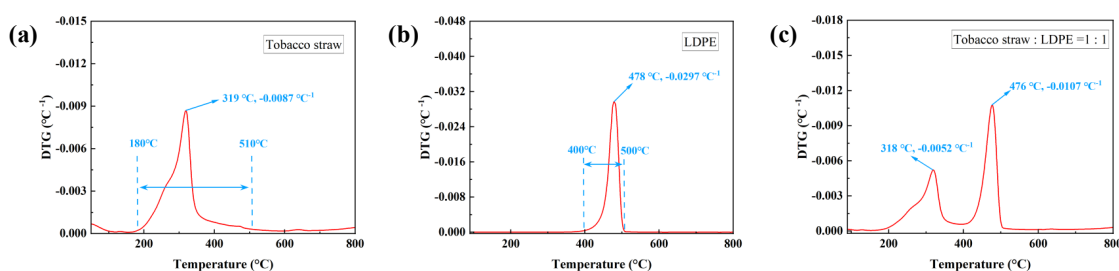


Figure. S1 DTG curves of Tobacco straw (a), LDPE (b), and Tobacco straw- LDPE (c).