Supporting information

A Systematic Study of the Physicochemical Properties of 3D Welan Gum-Graphene Oxide Composite Hydrogels with Efficient Dye Adsorption Capacity

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Figure S1 Rheological results for welan gum-GO composite hydrogels formed by 5 mg mL⁻¹ GO with different concentration of welan gum measured at 20.0 ± 0.1 °C. (A) Elastic modulus (G') and viscous modulus (G'') as a function of the applied stress at a constant frequency (1.0 Hz); variation of G' and G'' (B) and complex viscosity (C) as a function of frequency. (D) Variation of shear
viscosity as a function of shear rate.

**Figure S2** (A) FT-IR spectra and (B) XRD results of freeze-dried samples composed of (a) 5 mg mL⁻¹ welan gum/5 mg mL⁻¹ GO, (b) 6 mg mL⁻¹ welan gum/5 mg mL⁻¹ GO; (c) 7 mg mL⁻¹ welan gum/5 mg mL⁻¹ GO; (d) 8 mg mL⁻¹ welan gum/5 mg mL⁻¹ GO, (e) 9 mg mL⁻¹ welan gum/5 mg mL⁻¹ GO composite hydrogels.

**Figure S3** TGA curves of (a) welan gum, (b) welan gum/GO nanocomposite with 5 mg mL⁻¹ GO loading and (c) GO.
**Figure S4** The chemical structures of MB, MV, MO, AB10B, R6G and CAS.
Figure S5 Photos of the dye solutions before (A-D) and after (a-d) the removal by the welan gum–GO hybrid hydrogels: (A, a) 8 mg mL\(^{-1}\) welan gum, (B, b) 8 mg mL\(^{-1}\) welan gum/1 mg mL\(^{-1}\) GO, (C, c) 8 mg mL\(^{-1}\) welan gum/5 mg mL\(^{-1}\) GO, (D, d) 5 mg mL\(^{-1}\) welan gum/5 mg mL\(^{-1}\) GO.