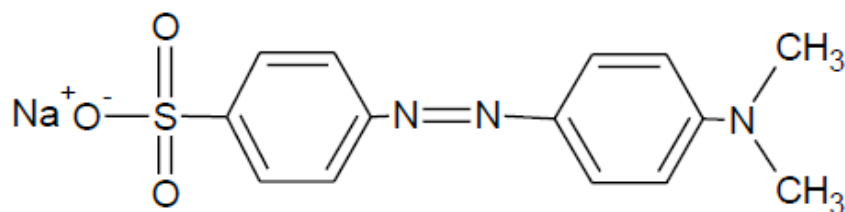


## Supplementary materials



**Figure S1.** Methyl orange dye MeO chemical structure.

**Table S1.** Methyl orange dye MeO physicochemical characteristics.

Chemical Name	Acide 4-, benzène sulfonique (forme acide) 4-, benzène sulfonate de sodium (sel de sodium)
CAS Number	547-58-0
Color Index (C.I.)	C.I. Acid Orange 52
Chemical Formula	C <sub>14</sub> H <sub>14</sub> N <sub>3</sub> O <sub>3</sub> Na
Molecular weight (g·mol <sup>-1</sup> )	327.33
$\lambda_{\text{max}}$ (nm)	463
Water solubility at 20°C (g·L <sup>-1</sup> )	5.20
Molecular size c(Å <sup>3</sup> )	14.38 × 6.56 × 4.04

**Table S2.** Textural properties obtained by N<sub>2</sub> adsorption/desorption studies on biochar MO<sub>C-ZnCl2</sub> and commercial activated carbon.

Property	Activated carbon	
	MO C-ZnCl <sub>2</sub>	CA Commercial (7440-44-0)
Pore size (nm)	≈2.00	≈18.09
S <sub>BET</sub> (m <sup>2</sup> /g)	699.69	812.14
S <sub> Micropores</sub> (m <sup>2</sup> /g)	601.99	219.33
S <sub> Ext</sub> (m <sup>2</sup> /g)	97.69	592.81
% S <sub> Micropores</sub>	86.03	27.00
% S <sub> Ext</sub>	13.96	72.99