Supplementary Material

Producing efficient adsorbents from Kraft lignin for the removal of contaminants from water- a full factorial design

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Results and discussions

Table S1. Chemical information about methylene blue (MB) and amoxicillin (AMX).

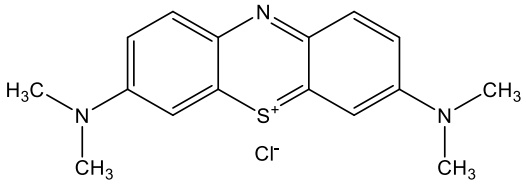
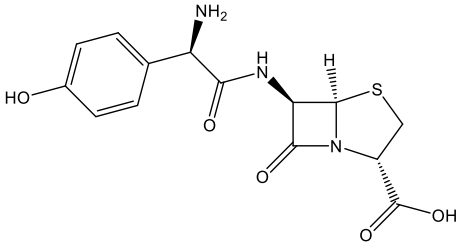
	Methylene blue (MB)	**Amoxicillin (AMX)**
Molecular formula	$C_{16}H_{18}N_3SCI$	$C_{16}H_{19}N_3O_5S$
IUPAC	3,7-bis(dimethylamino) phenothiazine chloride tetra methylthionine chloride	(2S,5R,6R)-6-[[(2R)-2-amino-2-(4-hydroxyphenyl)acetyl]amino]− 3,3-dimethyl-7-oxo-4-thia-1-azabicyclo [3.2.0]heptane-2-carboxylic acid)
Molar mass	319.85 g mol^{-1}	365.38 g mol^{-1}
λ max	665 nm	228 nm
pKa	3.8	2.68; 7.49; 9.63
Structure		

Table S2. Experimental conditions of experiments and responses obtained for the ACs samples.

Samples	Experimental conditions			Responses					
	TP	**RT**	**IR**	S_{BET} **($m^2 g^{-1}$)**	$V_{0.98}$ **($cm^3 g^{-1}$)**	**Yield (%)**	**Energy consumption (Wh)**	**MB (%)**	**AMX (%)**
$AC_{500\text{-}60\text{-}1:1}$	500	60	1:1	1025	0.59	29	726	76	96
$AC_{700\text{-}60\text{-}1:1}$	700	60	1:2	900	0.51	22	1144	69	94
$AC_{500\text{-}180\text{-}1:1}$	500	180	1:1	1035	0.59	26	2178	88	96
$AC_{500\text{-}60\text{-}1:2}$	500	60	1:2	1085	0.69	23	726	90	97
$AC_{500\text{-}180\text{-}1:2}$	500	180	1:1	1260	0.77	22	2178	90	98
$AC_{700\text{-}60\text{-}1:2}$	700	60	1:2	1335	0.80	18	1144	98	99
$AC_{700\text{-}180\text{-}1:1}$	700	180	1:1	750	0.42	20	3432	69	94
$AC_{700\text{-}180\text{-}1:2}$	700	180	1:2	1295	0.79	16	3432	97	98

TP- Pyrolysis temperature (500 °C (-) and 700 °C (+))

RT- Residence time (60 min (-) and 180 min (+))

IR- Precursor:activating agent ratio (1:1 (-) and 1:2 (+))

Figure S1. Main effects plot for yield (a), S_{BET} (b), MB adsorption (c), AMX adsorption (d), and energy consumption (e).

