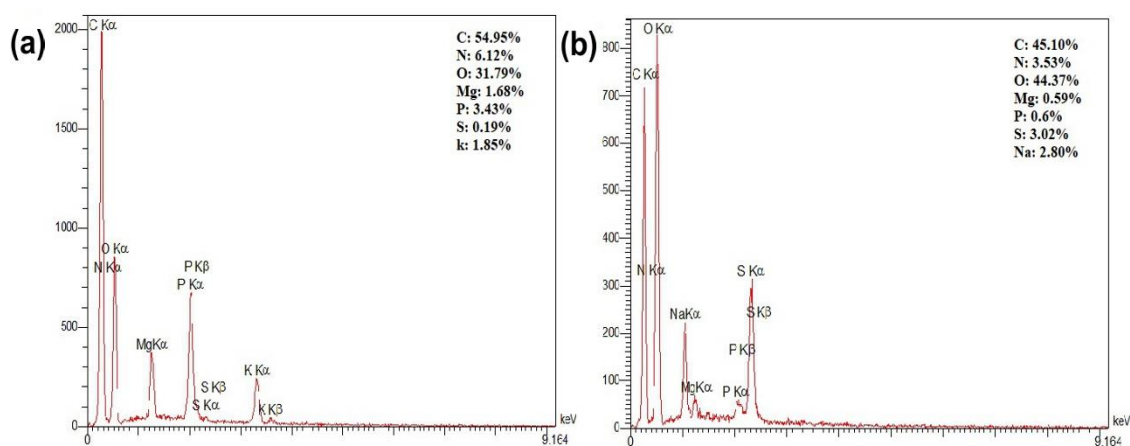
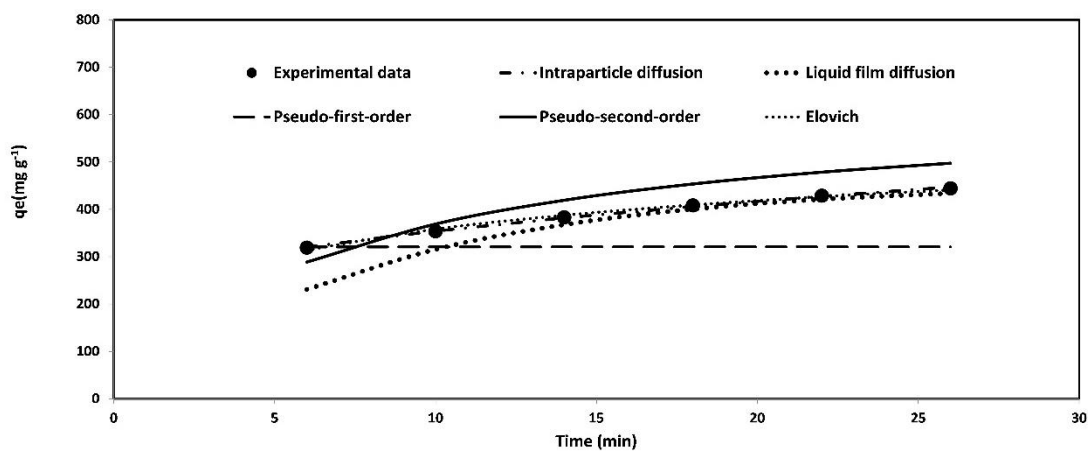


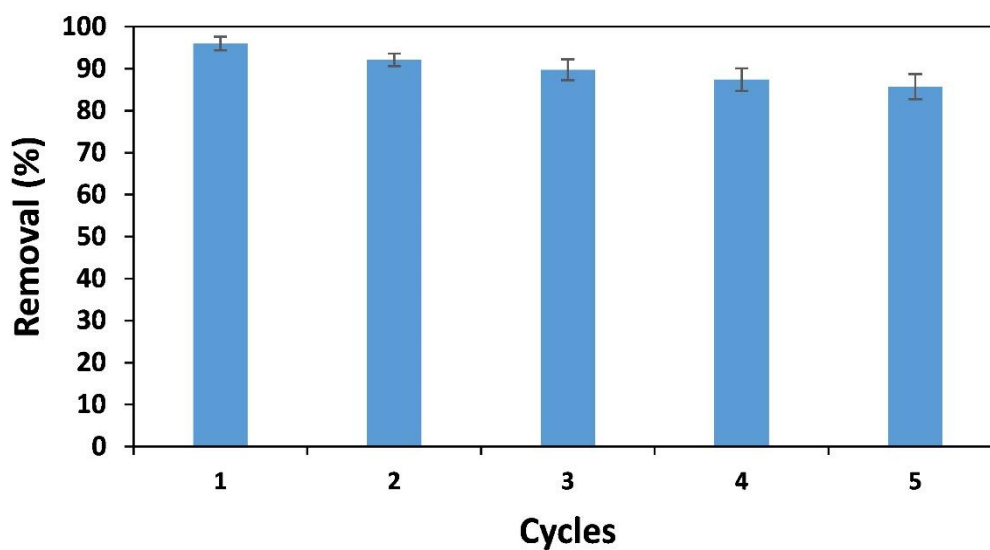
**Fig. S1.** (a)-(b) Sulfonation of rice bran using CSA in DMF medium. (c) The formation mechanism of CV onto MRB.



**Fig. S2.** (a) EDX of rice bran. (b) EDX of MRB.



**Fig. S3.** The kinetics of CV removal using MRB. MRB:  $800 \text{ mg L}^{-1}$ , Temperature:  $298 \text{ K}$ , CV:  $550 \text{ mg L}^{-1}$ .



**Fig. S4.** Desorption of MRB for CV removal using HCl 0.5 mol.L<sup>-1</sup> solution.

**Table S1.** Response Values for RSM Design.

Run	Variables			Removal efficiency (mg g <sup>-1</sup> )
	A: Time (min)	B: adsorbent dosage (g L <sup>-1</sup> )	C: dye concentration (mg L <sup>-1</sup> )	
1	2	0.2	550	6.3
2	2	1.1	1000	22.3
3	31	1.1	550	85.8
4	31	1.1	550	78.3
5	60	0.2	550	20.5
6	31	1.1	550	83.7
7	2	2	550	70.1
8	31	2	1000	87.5
9	31	1.1	550	81.8
10	31	2	100	80.5
11	2	1.1	100	85.9
12	31	1.1	550	78.9
13	31	0.2	100	73.3
14	31	0.2	1000	4.1
15	60	2	550	98.9
16	60	1.1	100	93.8
17	60	1.1	1000	54.9

**Table S2.** Performance of Different Isotherms for CVAadsorption Using MRB at 298 K

Model	$\chi^2$	RMSE	$R^2$
Temkin	3.12	15.897	0.9882
Freundlich	25.18	45.25	0.9487
Langmuir	1.168	9.049	0.9979
Dubinin-Radushkevich	66.053	69.621	0.8591
Radke-Prausnitz	0.474	5.933	0.9989
Redlich-Peterson	0.474	5.933	0.9989
UT Isotherm	0.474	5.933	0.9989

**Table S3.** Parameters of Thermodynamic for CV Removal Using MRB

T (K)	Ln $K_e$	$\Delta G^0$ (kJ mol <sup>-1</sup> )	$\Delta S^0$ (J mol <sup>-1</sup> K <sup>-1</sup> )	$\Delta H^0$ (kJ mol <sup>-1</sup> )
279	0.203	-0.469	135.19	37.892
286	0.608	-1.44		
296	1.312	-3.23		
304	1.386	-3.51		
315	1.792	-4.69		
328	2.850	-7.78		

**Table S4.** The Reported Adsorption Capacity of Various Adsorbents for CV Removal

materials	$q_m$ (mg g <sup>-1</sup> )	Reference
wood apple shell (WAS)	130	(1)
Eichhornia crassipes	21	(2)
Tendu waste (TLR-2N)	67.57	(3)
Pará chestnut husk	83.6	(4)
Biochar of wood chip	195	(5)
Eragrostis plana Nees	76.2	(6)
Cucumis sativus (RCS)	33.22	(7)
Papaya seeds	85.99	(8)
peanut hull waste	150	(9)
Skin Almonds Waste	85.47	(10)
Terminalia arjuna sawdust waste	45.99	(11)
Modified spirulina	101.87	(12)

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