

1 Preparation of Manganese Dioxide Nanoparticle on Laterite for

2 Methylene Blue Degradation

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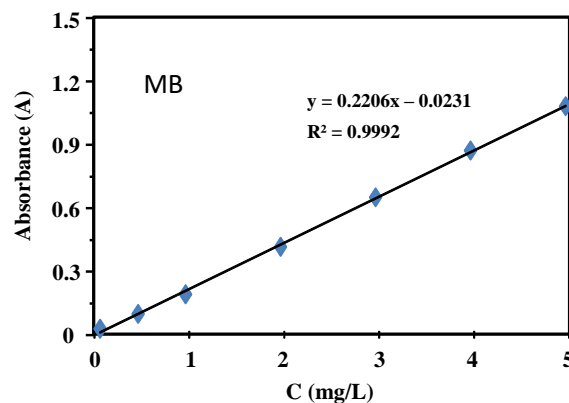
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20 Supplementary Materials

21 The MB concentration in aqueous solution was determined as a flowing process. The MB
22 solution sample was measured the optical absorbance (Abs) of the solution at the maximum
23 absorption of λ_{\max} to about 644 nm on UV1800, Japan. Thus, the calibration graph of ion MB
24 solution at λ_{\max} to about 644 nm with varying initial MB concentration from 0.1, 0.5, 1.0, 2.0,
25 3.0, 4.0, to 5.0 mg/L was obtained in Figure S1.



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Figure S1: The calibration graph of MB solution at λ_{\max} to about 644 nm

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32 Table S1: The effect of time on adsorption percentage of M2 for MB.

Time (hours)	1	2	3	4	5	6	7
C₀ (mg/L)	80	80	80	80	80	80	80
C_e (mg/L)	66.2	59.6	51.2	44.8	41.52	39.18	38.88
Adsorption(%)	17.3	25.5	36.0	44.0	48.1	51.0	51.4

33 Table S2: The effect of MB concentration solution on the adsorption capacity.

C₀(mg/L)	10	20	40	60	80	100	150	200	300
C_e(mg/L)	0.65	2.13	14.38	24.56	39.18	56.45	85.34	125.02	201.2
q_s (mg/g)	0.94	1.79	2.56	3.54	4.1	4.36	6.47	7.5	9.88
Adsorption (%)	93.5	89.35	64.05	59.06	51.02	43.55	43.01	37.49	32.93

34 Table S3: Effect of the hydrogen peroxide concentration on the degradation percentage of MB

The amount of H₂O₂ (mL)	0.2	1.0	1.5	2.0	2.5	3.5	4.0	4.5	5.0
C₀ (mg/L)	20	20	20	20	20	20	20	20	20
C_e (mg/L)	6.0	2.87	2.36	2.26	2.25	2.21	2.2	2.19	2.19
Degradation (%)	70	85.64	88.20	88.69	88.74	88.95	89	89.01	89.01

35 Table S4: Effect of time on the degradation percentage of MB

Time (mins)	15	30	45	60	90	120	150	180
C₀ (mg/L)	20	20	20	20	20	20	20	20
C_e (mg/L)	2.958	2.29	2.20	2.10	2.01	1.98	1.89	1.88
Degradation (%)	85.21	88.53	89.0	89.49	89.92	90.06	90.51	90.6

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39 Table S5: The effect of pH on the degradation percentage of MB

pH	2	5	6	7	8	10	12
C₀ (mg/L)	20	20	20	20	20	20	20
C_e (mg/L)	8.02	4.33	2.86	3.32	3.50	0.0	0.0
Degradation (%)	59.9	78.33	85.69	83.4	82.47	100	100

40 Table S6: The effect of the amount of the M2 on the degradation percentage of MB

Weigh M2 (g)	0.2	1.0	1.5	2.0	2.5	3.5	4.0	4.5
C₀ (mg/L)	20	20	20	20	20	20	20	20
C_e (mg/L)	3.356	2.60	2.27	2.25	2.23	2.21	2.20	2.19
Degradation (%)	83.22	87.0	88.61	88.74	88.81	88.95	89.0	89.03

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