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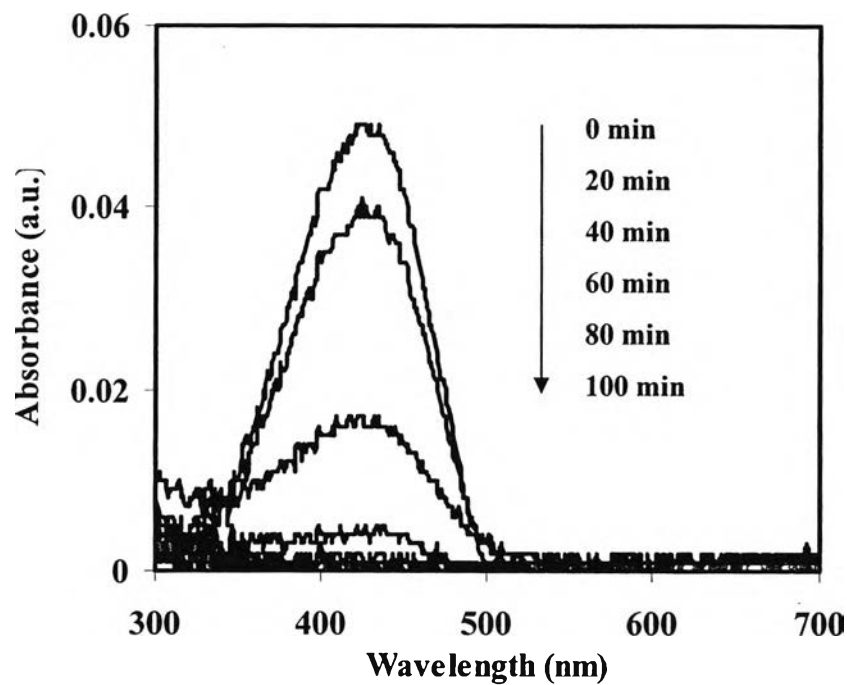
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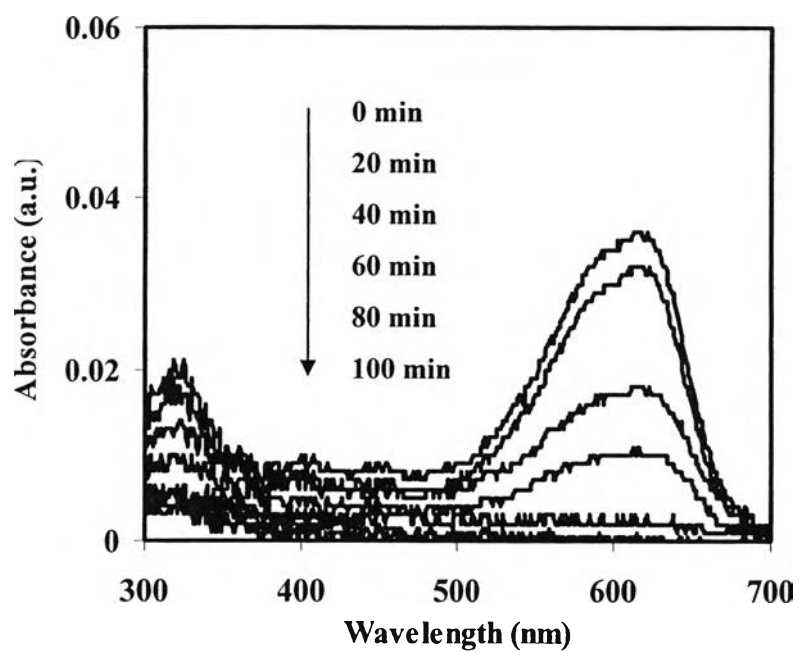
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## APPENDICES

### Appendix A Examples of Time Dependence of UV-Visible Absorption Spectra of Azo Dye Solutions



**Figure A1** UV-Vis absorption spectra of AY solution at various irradiation times (photocatalyst dosage = 5 g/l; initial AY concentration = 5 mg/l; reaction volume = 80 ml)



**Figure A2** UV-Vis absorption spectra of AB solution at various irradiation times (photocatalyst dosage = 5 g/l; initial AB concentration = 5 mg/l; reaction volume = 80 ml)

### Appendix B Experimental Data of Degradation Efficiency for Azo Dyes under Various Operating Conditions

**Table B1** Effect of photocatalyst dosage on degradation efficiency for the mixture of AY 5 mg/l and AB 2.5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (reaction volume = 80 ml, irradiation time = 90 min)

Photocatalyst dosage (g/l)	Degradation efficiency (%)		
	AY	AB	TOC
0	4	9.2	3
5	85.7	92.5	79
7	89	94	84.7
10	94.2	98	91.3
12	92.3	94.7	89.1
15	88.1	90.5	83.4

**Table B2** Effect of photocatalyst dosage on degradation efficiency for the mixture of AY 2.5 mg/l and AB 5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (reaction volume = 80 ml, irradiation time = 90 min)

Photocatalyst dosage (g/l)	Degradation efficiency (%)		
	AY	AB	TOC
0	6	10	3.6
5	86.4	93.2	85.1
7	90.2	96.6	87.7
10	95.7	99.1	92.5
12	93.1	95.1	89.6
15	88.8	91.1	88



**Table B3** Effect of dissolved oxygen on degradation efficiency for the mixture of AY 5 mg/l and AB 2.5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (photocatalyst dosage = 10 g/l, reaction volume = 80 ml, irradiation time = 90 min).

Dissolved oxygen (mg/l)	Degradation efficiency (%)		
	AY	AB	TOC
0 (N <sub>2</sub> bubbling)	83.7	81.5	80
7.5 (No gas bubbling)	98	94.2	91.3
8.8 (Air bubbling)	98.8	95.4	91.8
37.7 (O <sub>2</sub> bubbling)	99.6	97.7	95.2

**Table B4** Effect of dissolved oxygen on degradation efficiency for the mixture of AY 2.5 mg/l and AB 5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (photocatalyst dosage = 10 g/l, reaction volume = 80 ml, irradiation time = 90 min)

Dissolved oxygen (mg/l)	Degradation efficiency (%)		
	AY	AB	TOC
0 (N <sub>2</sub> bubbling)	85.3	82.6	80
7.5 (No gas bubbling)	99.1	95.7	92.5
8.8 (Air bubbling)	99.2	96.9	93
37.7 (O <sub>2</sub> bubbling)	99.8	98.8	95.7

**Table B5** Effect of initial solution pH on degradation efficiency for the mixture of AY 5 mg/l and AB 2.5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (photocatalyst dosage = 10 g/l, reaction volume = 80 ml, irradiation time = 60 min)

Initial solution pH	Degradation efficiency (%)		
	AY	AB	TOC
4	82.1	73	79
4.5	94	90	88
5	91	86	83
6	84	78.5	77.4
7	76.5	72	70.3

**Table B6** Effect of initial solution pH on degradation efficiency for the mixture of AY 2.5 mg/l and AB 5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (photocatalyst dosage = 10 g/l, reaction volume = 80 ml, irradiation time = 60 min)

Initial solution pH	Degradation efficiency (%)		
	AY	AB	TOC
4	87	75.8	80.2
4.5	98	91	90
5	94	86.3	86
6	89.1	80	83.4
7	84.6	76	80

**Table B7** Effect of hardness type and concentration on degradation efficiency for the mixture of AY 5 mg/l and AB 2.5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (photocatalyst dosage = 10 g/l, reaction volume = 80 ml, irradiation time = 60 min, initial solution pH = 4.5)

Hardness type and concentration	Degradation efficiency (%)		
	AY	AB	TOC
No hardness	94	90	88
Ca 100 mg/l	89.2	82.6	80
Ca 200 mg/l	82.5	75.2	70.4
Ca 500 mg/l	69.3	64	56.7
Mg 100 mg/l	88.1	80.9	78.7
Mg 200 mg/l	80	70.6	64.1
Mg 500 mg/l	66.7	62	52
Ca+Mg 100 mg/l	87.3	78.9	74
Ca+Mg 200 mg/l	74.9	67.1	53.9
Ca+Mg 500 mg/l	62	57	46.2

**Table B8** Effect of hardness type and concentration on degradation efficiency for the mixture of AY 2.5 mg/l and AB 5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (photocatalyst dosage = 10 g/l, reaction volume = 80 ml, irradiation time = 60 min, initial solution pH = 4.5)

Hardness type and concentration	Degradation efficiency (%)		
	AY	AB	TOC
No hardness	98	91	90
Ca 100 mg/l	92.1	84.8	81.2
Ca 200 mg/l	84.8	77	74.4
Ca 500 mg/l	74	68.5	66
Mg 100 mg/l	90.9	83	81.5
Mg 200 mg/l	82.5	72	68.7
Mg 500 mg/l	70	64	52.8
Ca+Mg 100 mg/l	88.3	82.4	77.2
Ca+Mg 200 mg/l	79.7	67.4	59.5
Ca+Mg 500 mg/l	67	57	48

**Table B9** Effect of initial solution pH on degradation efficiency in the presence of hardness for the mixture of AY 5 mg/l and AB 2.5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (photocatalyst dosage = 10 g/l, reaction volume = 80 ml, irradiation time = 60 min, total hardness concentration = 500 mg/l)

Initial solution pH	Degradation efficiency (%)		
	AY	AB	TOC
4.5 (No hardness)	94	90	88
4	71.7	57.1	42.4
4.5	78.7	63.4	48.2
5	89.8	85	70
5.5	82.7	63.1	44.9
6	59	49	44
7	56.2	48.2	31.9
8	52.3	45.4	30.1

**Table B10** Effect of initial solution pH on degradation efficiency in the presence of hardness for the mixture of AY 2.5 mg/l and AB 5 mg/l using the synthesized mesoporous-assembled TiO<sub>2</sub> photocatalyst (photocatalyst dosage = 10 g/l, reaction volume = 80 ml, irradiation time = 60 min, total hardness concentration = 500 mg/l)

Initial solution pH	Degradation efficiency (%)		
	AY	AB	TOC
4.5 (No hardness)	98	91	90
4	71.8	57.6	44.7
4.5	77	66	48.1
5	92.5	88	72
5.5	73.2	70.7	49.5
6	64	54	46
7	59.9	50.1	32.1
8	55.6	48.7	26.8

