SUPPORTNING INFORMATION

Comparison of the Photocatalytic Efficiencies of Continuous Stirred Tank Reactor (CSTR) and Batch Systems Using a Dispersed Micron Sized Photocatalyst

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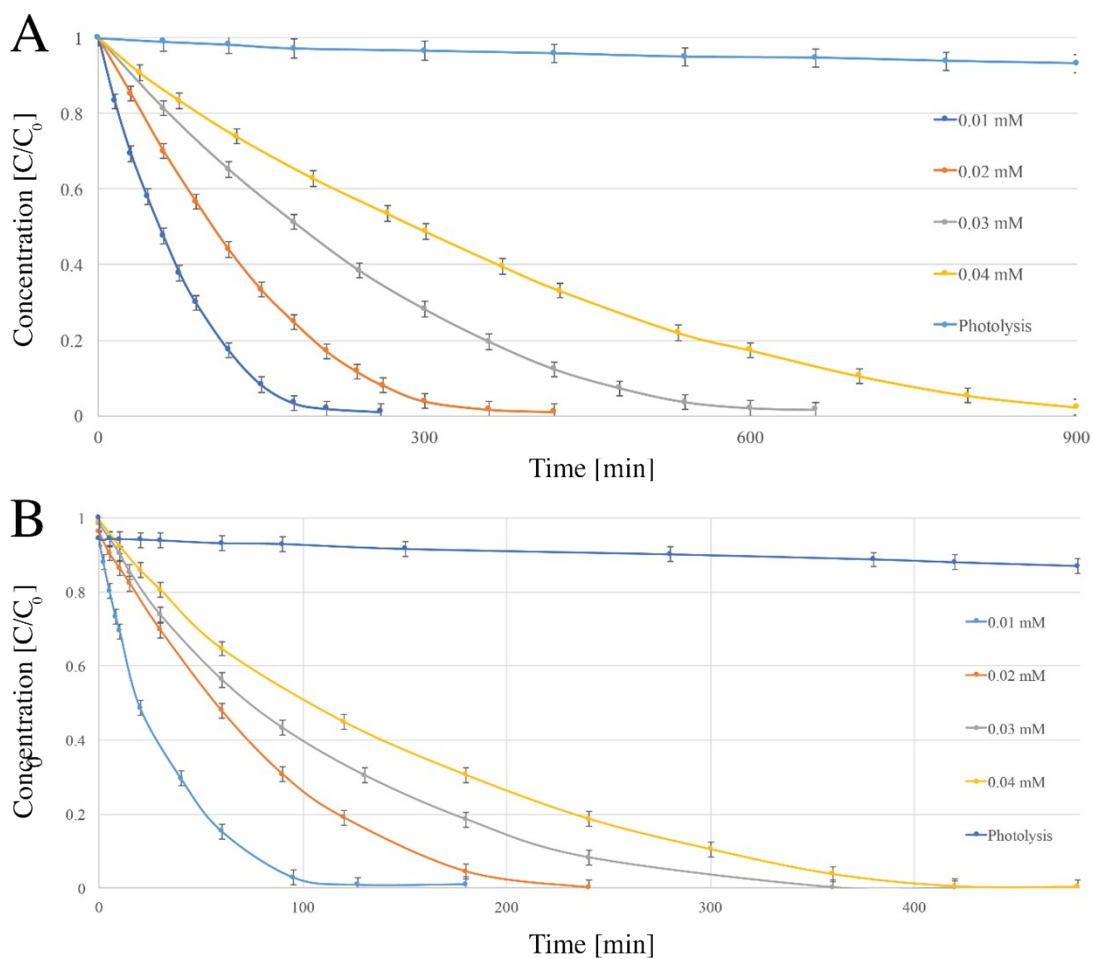**Corresponding Author: masho@unimelb.edu.au*

Figure S1: Photodegradation of MY (A) and RB (B) at a concentration between 0.01 and 0.04 mM with a catalyst concentration of 0.2 g/L. Photolysis experiments were carried out at a concentration of dye of 0.01 mM.
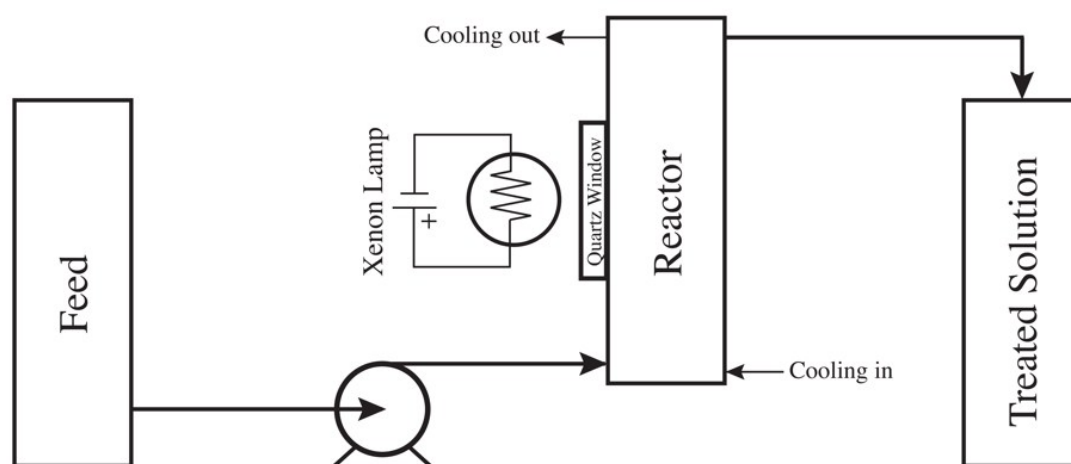

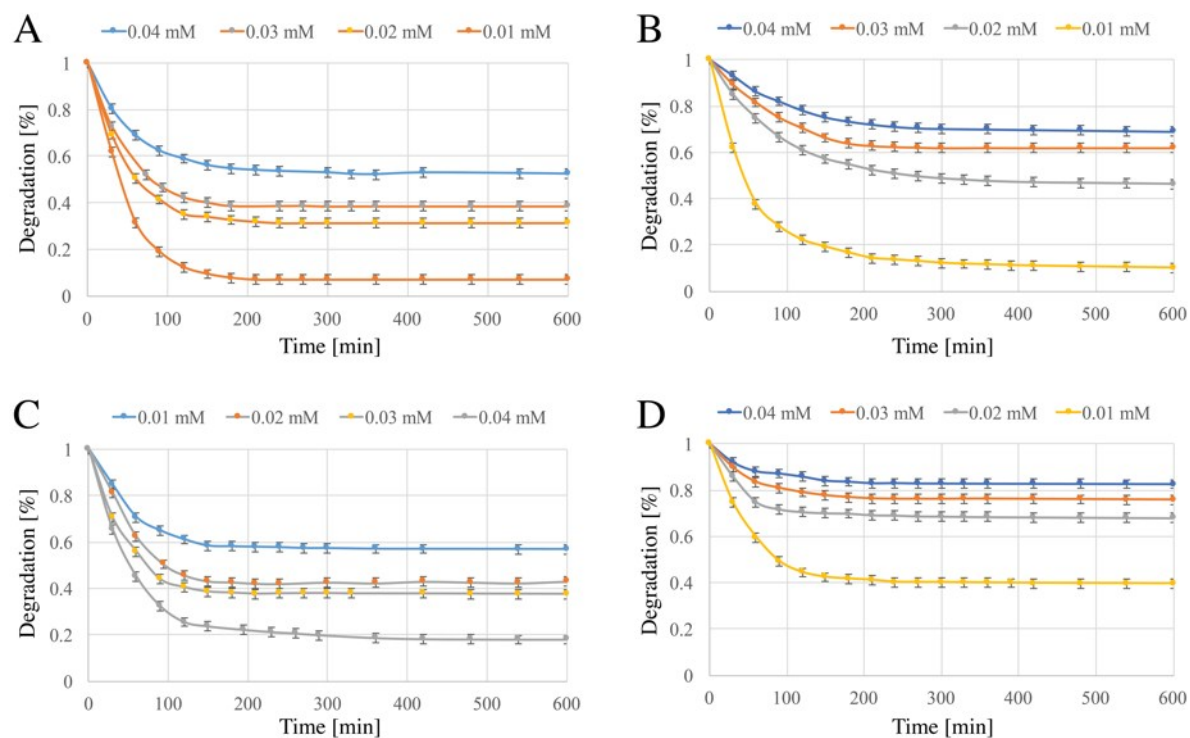**Figure S2:** Diagram of the CSTR configuration.

Figure S3: CSTR degradation of RB (A and C) and MY (B and D). In picture A and B the flow rate used was 2 mL/min, while in C and D it was 4 mL/min.
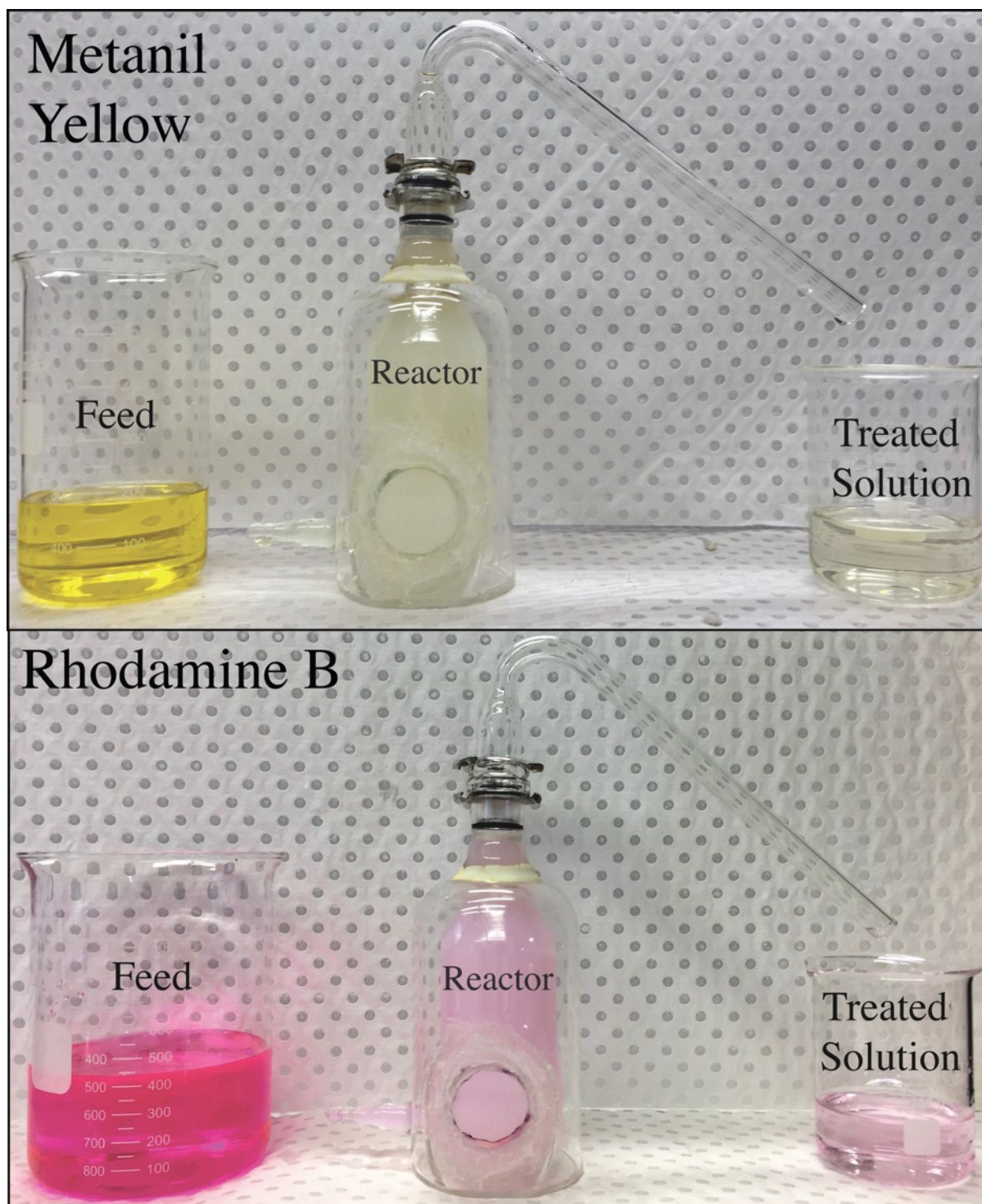
Figure S4: Photo of feeding solution, reactor and output of MY and RB after reaching the steady state. Both dyes were run with a concentration of 0.01 mM and a flow rate of 2 mL/min.

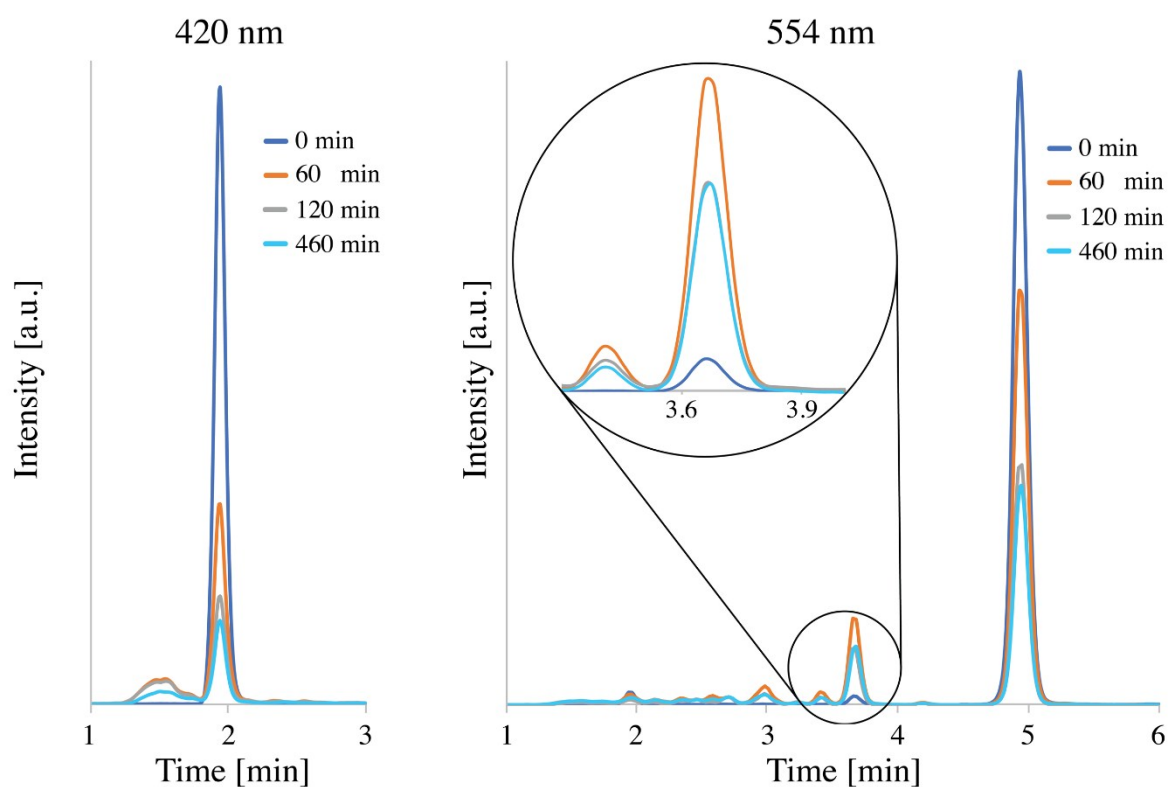**Figure S5:** HPLC analyses of a mixture run in the CSTR system. The solution was composed by 0.02 mM of MY and 0.03 mM of RB.
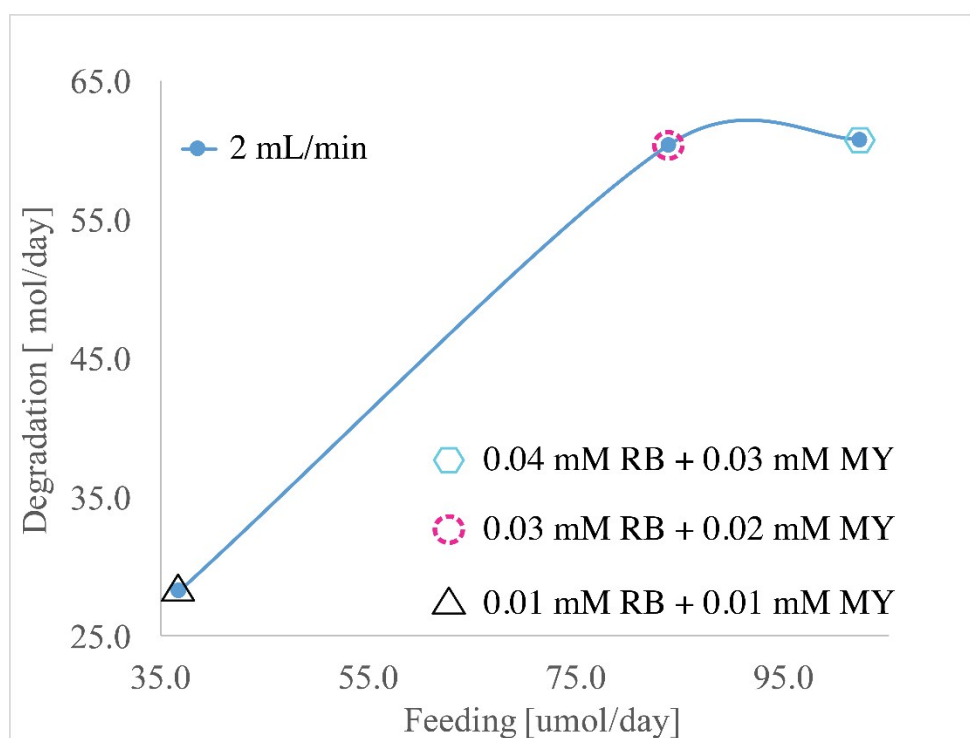

Figure S6: HPLC analyses of a mixture run in the CSTR system. The solution was composed by 0.02 mM of MY and 0.03 mM of RB. The feeding was calculated using equation 3, while the degradation was calculated using equation 4.
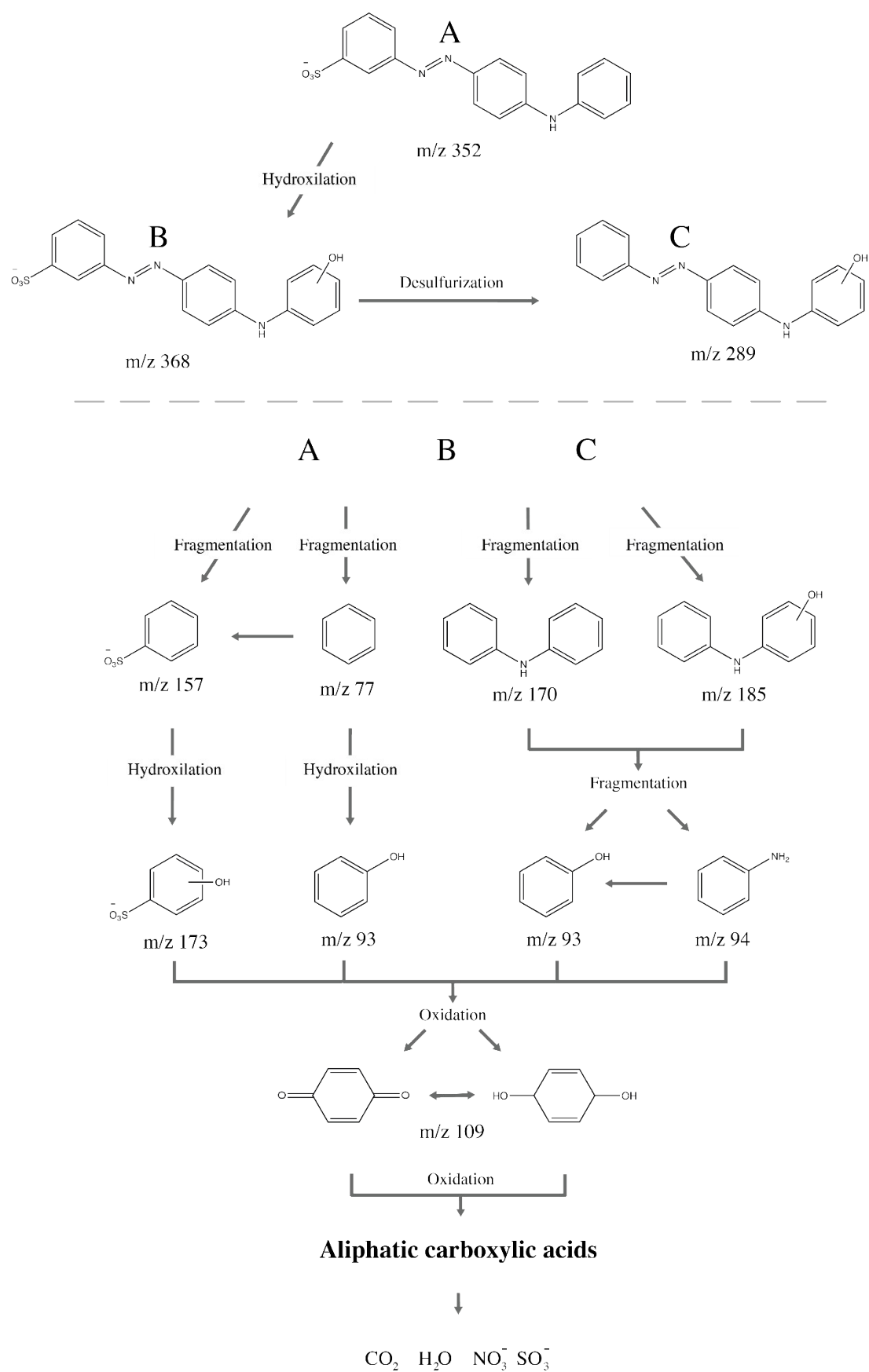
Figure S7: Proposed mechanism of photodegradation of Metanil Yellow.

m/z	Number of N-deacetylation	m/z
415	1	431
387	2	403
359	3	375

Hydroxilation

N-Deacetylation/s

Hydroxilation

N-Deacetylation/s

m/z 443

m/z 459

m/z 331

m/z 347

Deamination

Deamination

Hydroxilation

Fragmentation

m/z 302

m/z 318

m/z 182

Hydroxilation

m/z 198

m/z 214

m/z 109

m/z 122

m/z 105

m/z 90

CO_2 + H_2O

Figure S8: Proposed mechanism of photodegradation of Rhodamine B.

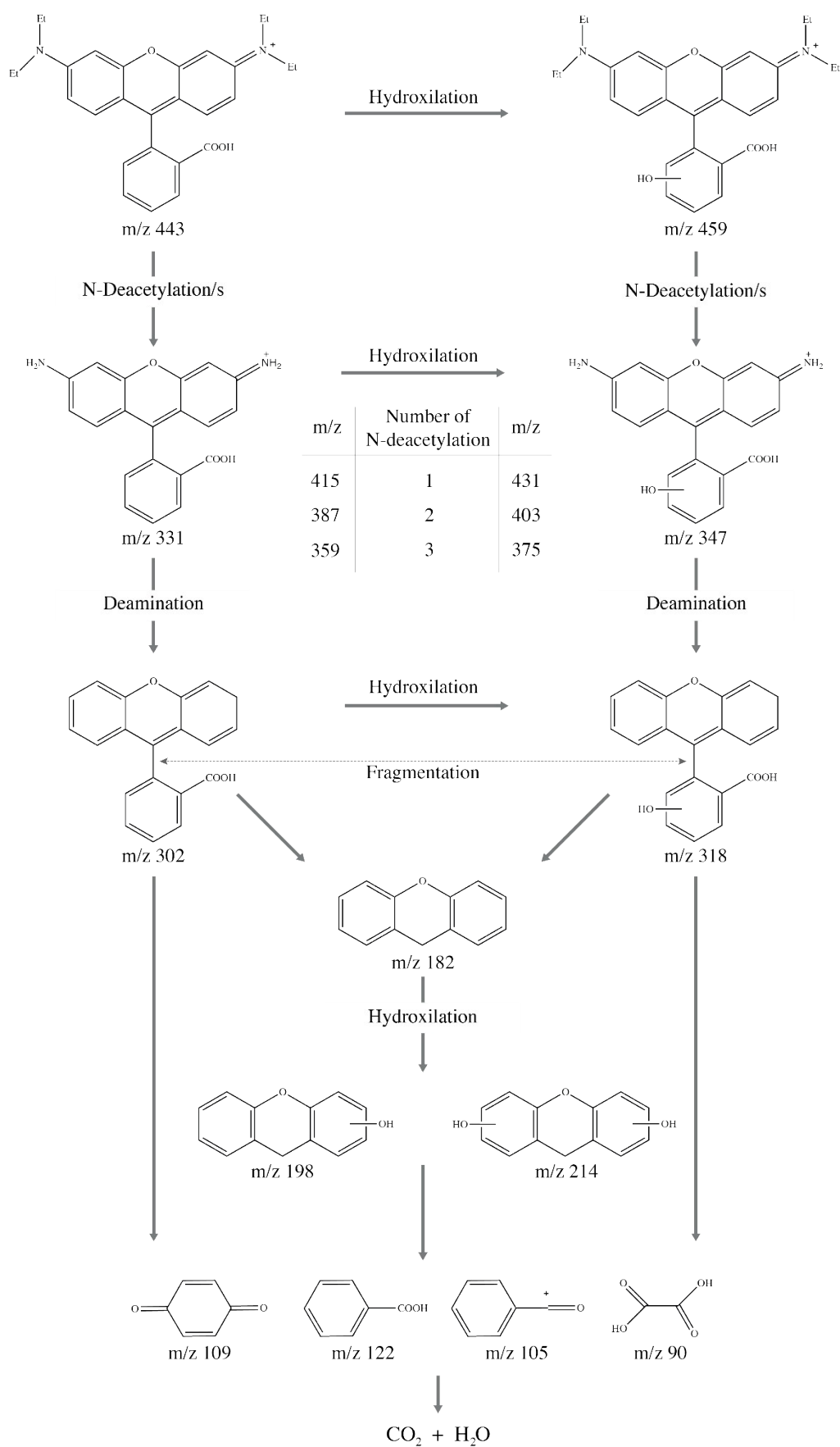| Sample	TC [ppm]	IC [ppm]	TOC [ppm]	Start TOC [ppm]	Degrad. TOC [%]	Degrad. UV/Vis [%]
Batch - MY - 0.02 mM - 240 min	1.8	1.2	0.5	3.9	85.9	90
Batch - MY - 0.04 mM - 700 min	2.4	1.3	1.1	7.6	85.6	88
Batch - RB - 0.02 mM - 180 min	1.8	1.0	0.8	6.2	87.1	93
Batch - RB - 0.04 mM - 300 min	2.5	1.1	1.4	12.2	88.6	91
CF - RB - 0.02 mM - 2 mL/min	5.6	3.3	2.3	6.9	66.6	70
CF - RB - 0.03 mM - 1 mL/min	6.3	1.6	4.7	11.8	60.1	66
CF - RB - 0.02 mM - 1 mL/min	4.8	1.5	3.3	7.4	55.0	61
CF - RB - 0.03 mM - 2 mL/min	6.3	1.4	5.0	11.6	57.3	62
CF - RB - 0.04 mM - 1 mL/min	9.4	1.4	8.0	15.4	48.1	52
CF - RB - 0.04 mM - 2 mL/min	9.8	1.5	8.3	15.0	44.5	48
CF - RB - 0.04 mM - 1 mL/min	10.5	1.5	9.0	14.8	39.2	43
CF - MY - 0.02 mM - 1 mL/min	3.9	1.4	2.4	4.3	43.9	49
CF - MY - 0.02 mM - 2 mL/min	4.1	1.3	2.8	4.4	36.3	38
CF - MY - 0.03 mM - 1 mL/min	4.8	1.3	3.5	6.7	47.6	49
CF - MY - 0.03 mM - 2 mL/min	5.9	1.8	4.1	6.5	36.2	38
CF - MY - 0.04 mM - 1 mL/min	6.1	1.3	4.8	8.6	44.5	49
CF - MY - 0.04 mM - 2 mL/min	7.0	1.3	5.7	8.8	34.4	38
CF - RB & MY - 0.01 mM each - 1 mL/min	2.9	1.3	1.6	6.2	74.3	77
CF - RB & MY - 0.02 mM each - 1 mL/min	8.8	1.4	7.4	17.8	58.6	59

Table S1: Comparison of some of the degradation values of rhodamine B (RB) and metanil yellow (MY) in batch and continuous flow (CF) system using TOC and UV/Vis absorption analyses.

Concentration	Feed molar flow [μmol/day]	Decomposed dye [μmol/day]
MY 0.01 mM – Solution A	18	15
MY 0.02 mM – Solution B	33	25
MY 0.03 mM – Solution C	43	23
RB 0.01 mM – Solution A	18	12
RB 0.03 mM – Solution B	50	34
RB 0.04 mM – Solution C	59	37

Table S2: Results from the degradations of combined mixtures of RB and MY at different flow rates. In details, solution A was used at flow rate of 1 ml/min, solution B at 2 ml/min, and solution C at 4 ml/min.