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Electronic Supplementary Information

Selective photocatalytic aerobic bromination with hydrogen bromide via an electron-transfer state of 9-mesityl-10-methylacridinium ion

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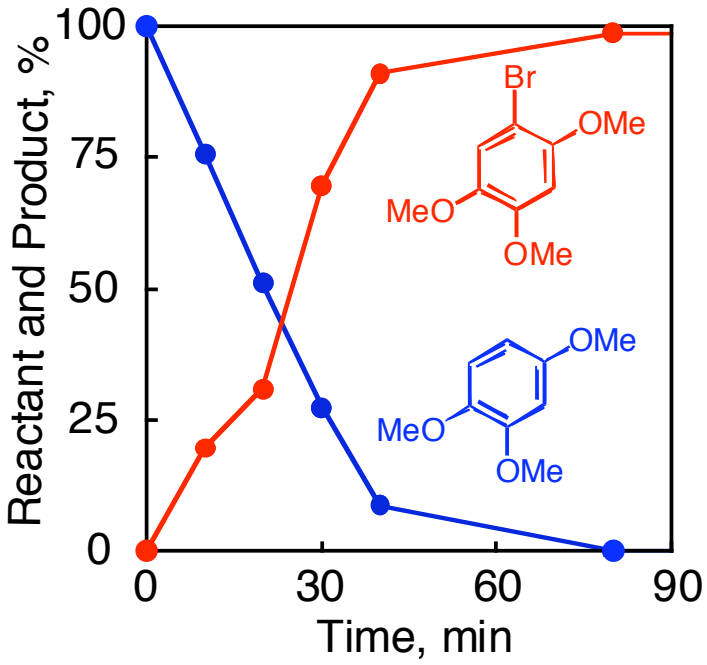

Fig. S1. Time dependence of the reaction of an oxygen-saturated CD_3CN solution containing $[Acr^+\text{-Mes}]ClO_4^-$ (2.0×10^{-4} M), 1,2,4-trimethoxybenzene (4.0×10^{-3} M) and HBr (2.0×10^{-2} M) under photoirradiation ($\lambda > 320$ nm).

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S2: ^{1}H NMR chemical shift of products

2,4,5–Trimethoxybromobenzene: ^{1}H NMR (CD_3CN, 300 MHz) δ 7.08 (s, 1H), 6.71 (s, 1H), 3.82 (s, 3H), 3.81 (s, 3H), 3.79 (s, 3H) ppm; 2,4,6–trimethoxybromobenzene: ^{1}H NMR (CD_3CN) δ 6.27 (s, 2H), 3.83 (s, 3H), 3.80 (s, 6H) ppm; 2,4–dimethoxybromobenzene: ^{1}H NMR (CD_3CN) δ 7.41 (d, J = 8.4 Hz, 1H), 6.59 (d, J = 2.4 Hz, 1H), 6.46 (dd, J = 2.4 Hz, 8.4Hz, 1H), 3.84 (s, 3H), 3.78 (s, 3H) ppm; 2,4–dimethoxy–1,5–dibromobenzene: ^{1}H NMR (CD_3CN) δ 7.67 (s, 1H), 6.70(s, 1H), 3.90 (s, 6H) ppm; 4–bromo–1–methoxynaphthalene: ^{1}H NMR (CD_3CN) δ 8.27 (d, J = 8.4 Hz, 1H), 8.15 (d, J = 9.0 Hz, 1H), 7.74 (d, J = 8.1 Hz, 1H), 7.65 (t, J = 8.1 Hz, 1H), 7.59 (t, J = 8.1 Hz, 1H), 6.86 (d, J = 8.4 Hz, 1H), 4.00 (s, 3H) ppm; 2,2'–dibromo–5,5'–bithiophene: ^{1}H NMR (CD_3CN) δ 7.08 (d, J = 3.9 Hz, 2H), 7.00 (d, J = 3.9 Hz, 2H) ppm; 2,3,4–trimethoxybromobenzene: ^{1}H NMR (CD_3CN) δ 7.26 (d, J = 9.0 Hz, 1H), 6.71 (d, J = 9.0 Hz, 1H), 3.83 (s, 3H), 3.81 (s, 3H), 3.79 (s, 3H) ppm; 1–bromo–2–methoxynaphthalene: ^{1}H NMR (CD_3CN) δ 8.27 (d, J = 8.7 Hz, 1H), 7.95 (d, J = 8.7 Hz, 1H), 7.88 (d, J = 8.7 Hz, 1H), 7.62 (tr, J = 8.1 Hz, 1H), 7.47-7.42 (m, 2H), 4.00 (s, 3H) ppm; 4–bromoanisol: ^{1}H NMR (CD_3CN) δ 7.42 (d, J = 9.0 Hz, 2H), 6.86 (d, J = 9.0 Hz, 2H), 3.76 (s, 3H) ppm; 2–bromo–3–methylthiophene: ^{1}H NMR (CD_3CN) δ 7.31 (d, J = 5.4 Hz, 1H), 6.85 (d, J = 5.4 Hz, 1H) ppm; 3,4–dimethoxybromobenzene: ^{1}H NMR (CD_3CN) δ 7.06 (d, J = 1.5 Hz, 1H), 7.05 (dd, J = 1.5 Hz, 9.6 Hz 1H), 6.84 (d, J = 9.6 Hz 1H), 3.79 (s, 3H), 3.77 (s, 3H) ppm; 2–methyl–4–methoxybromobenzene: ^{1}H NMR (CD_3CN) δ 7.43 (d, J = 9.0 Hz, 1H), 6.90 (d, J = 3.0 Hz, 1H), 6.70 (dd, J = 9.0 Hz, 3.0 Hz 1H), 3.86 (s, 3H), 2.35 (s, 3H) ppm; 4,5–dimethoxy–2–methylbromobenzene: ^{1}H NMR (CD_3CN) δ 7.06 (s, 1H), 6.87 (s, 3H), 3.77 (s, 3H), 3.76 (s, 3H), 2.30 (s, 3H) ppm; 2.2'–dibromoterthiophene: ^{1}H NMR (CD_3CN) δ 7.14 (s, 1H), 7.09 (d, J = 3.9 Hz 2H), 7.05 (d, J = 3.9 Hz, 2H) ppm; 2,5–dimethyl–4–methoxybromobenzene: ^{1}H NMR (CD_3CN) δ 7.28 (s, 1H), 6.85 (s, 1H), 3.80 (s, 3H), 2.33 (s, 3H), 2.11 (s, 3H) ppm.