

Electronic Supplementary Information (ESI)

Disproportionation of a 2,2-diphenyl-1-picrylhydrazyl radical as a model of reactive oxygen species catalyzed by Lewis and/or Brønsted acids

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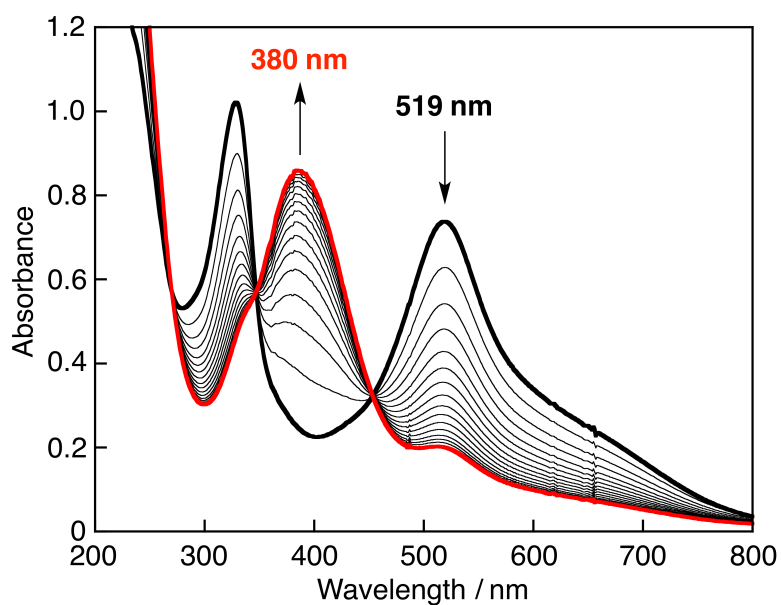


Fig. S1 Spectral change of DPPH• (6.5×10^{-4} M) during electrolysis using a spectroelectrochemical cell (1 mm id) (BAS) at +1.00 V vs. SCE with Pt working electrode in MeCN (0.1 M Bu₄NClO₄) at 298 K.

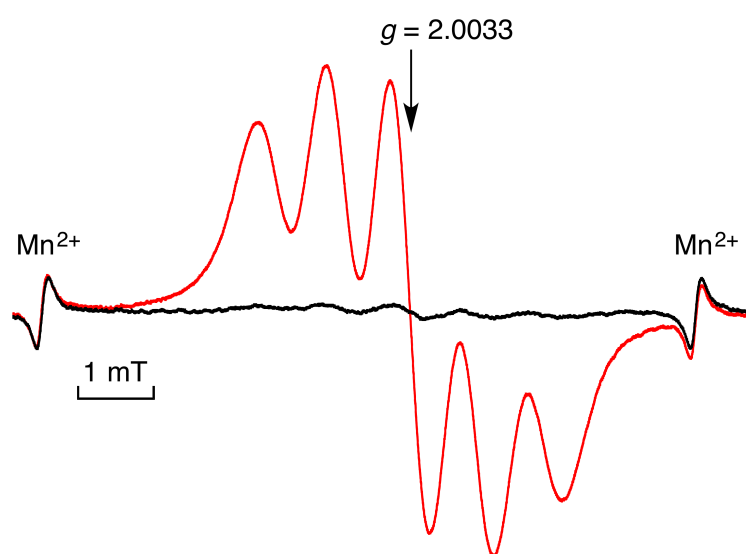


Fig. S2 EPR spectra of DPPH• (1.3×10^{-3} M) in the absence (red line) and presence (black line) of Sc(OTf)₃ (9.7×10^{-3} M) in MeCN at 298 K.

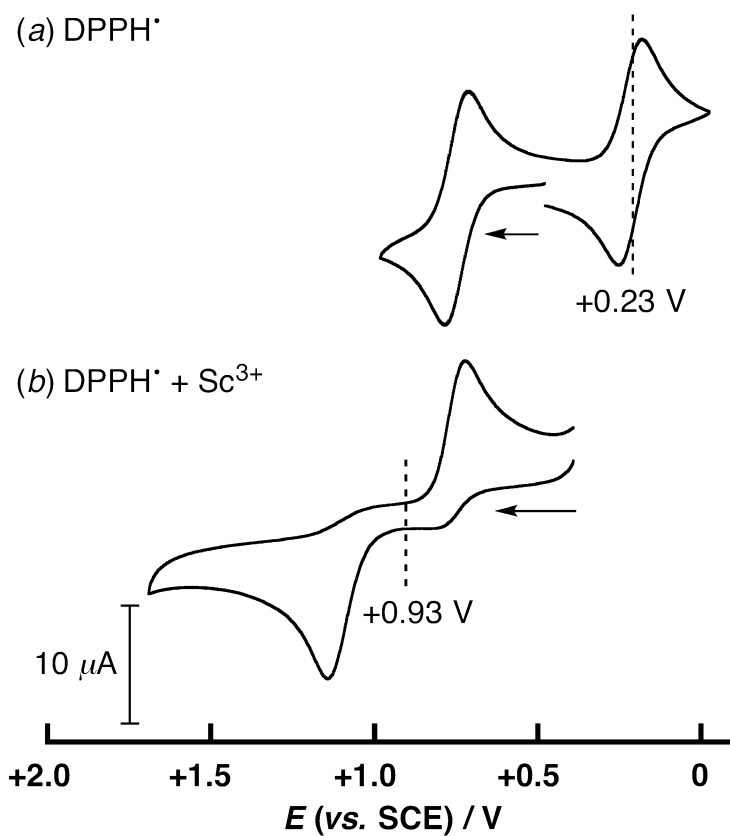


Fig. S3 Cyclic voltammograms of DPPH• (2.0×10^{-3} M) in the absence of Sc(OTf)₃ (a) and in the presence of Sc(OTf)₃ (2.0×10^{-3} M) (b) in deaerated MeCN containing 0.1 M Bu₄NClO₄ using a Pt working electrode at 298 K. Sweep rate: 100 mV s⁻¹. Arrows denote starting points and the direction of scanning.

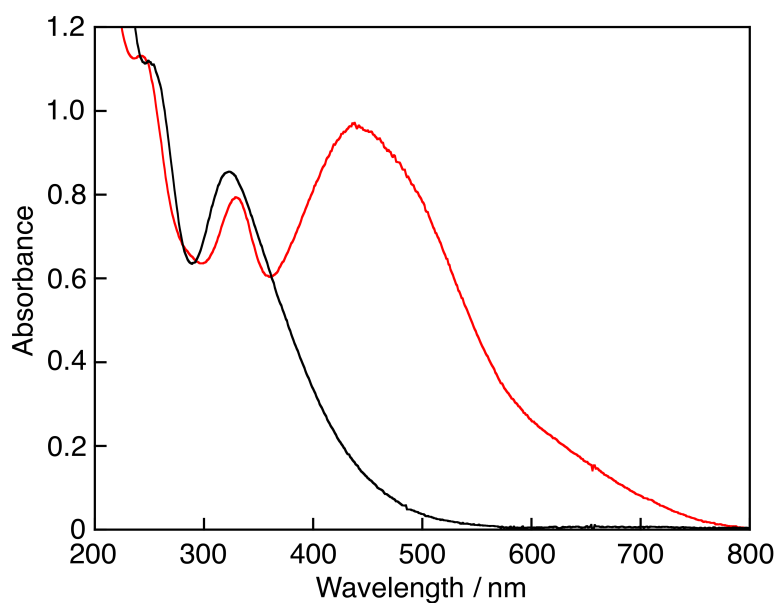


Fig. S4 UV-vis spectra of DPPH⁻ generated by electrochemical one-electron reduction of DPPH^{*} (1.3×10^{-3} M) using a spectroelectrochemical cell (0.5 mm id) (BAS) at -0.01 V vs. SCE with Pt working electrode in the absence (red line) and presence (black line) of Sc(OTf)₃ (6.8×10^{-3} M) in MeCN (0.1 M Bu₄NClO₄) at 298 K.

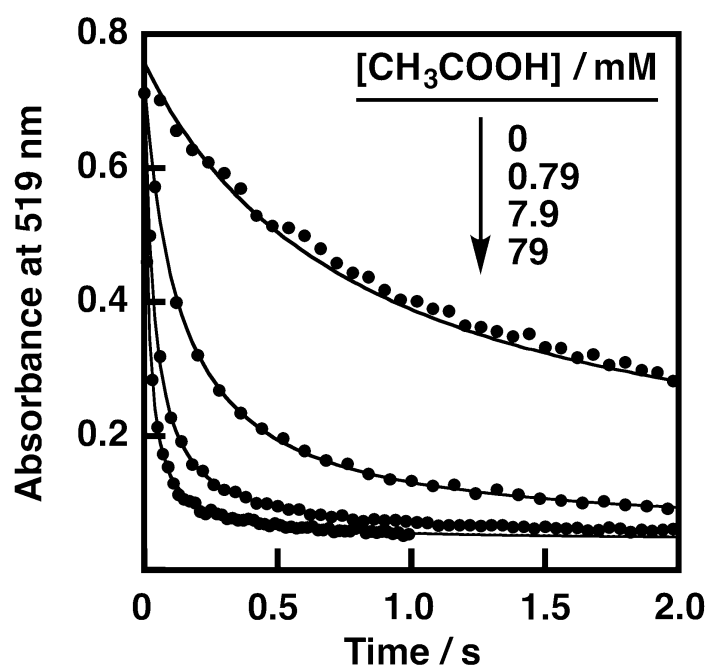


Fig. S5 Time courses of the absorbance change at 519 nm observed upon mixing of DPPH[•] (6.0×10^{-5} M) with Sc(OTf)₃ (8.0×10^{-3} M) in deaerated MeCN containing CH₃COOH (0, 0.79, 7.9 and 79 mM) at 298 K.

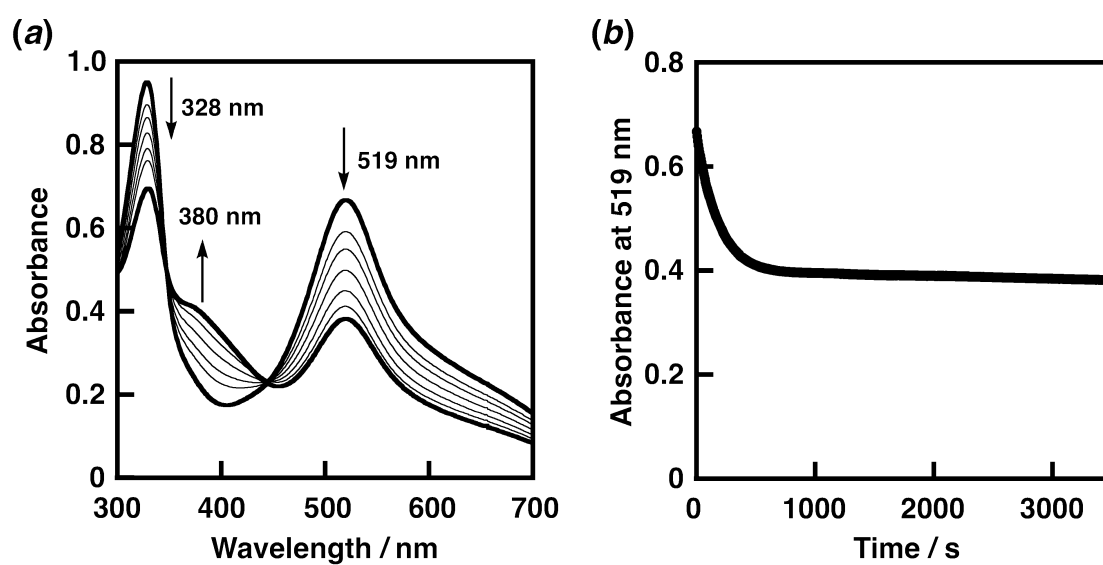


Fig. S6 (a) Spectral changes observed upon mixing of DPPH• (6.7×10^{-5} M) with LiClO₄ (0.2 M) and CH₃COOH (0.2 M) in deaerated MeCN at 298 K. (b) Time course of the absorbance change at 519 nm.