Kinetics of the reaction between the antioxidant Trolox® and the free radical DPPH° in semi-aqueous solution

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Electronic Supplementary Information

Additional information on absorption changes following mixing of the free-radical diphenylpicrylhydrazyl (DPPH°) with Trolox® (TrOH) in hydroalcoholic mixtures or neat ethanol is given below. The spectra were obtained with a stopped-flow equipped with a diode array. Hydroalcoholic mixtures were prepared by adding ethanol to the desired amount (vol/vol) of water that was previously buffered at the desired pH.

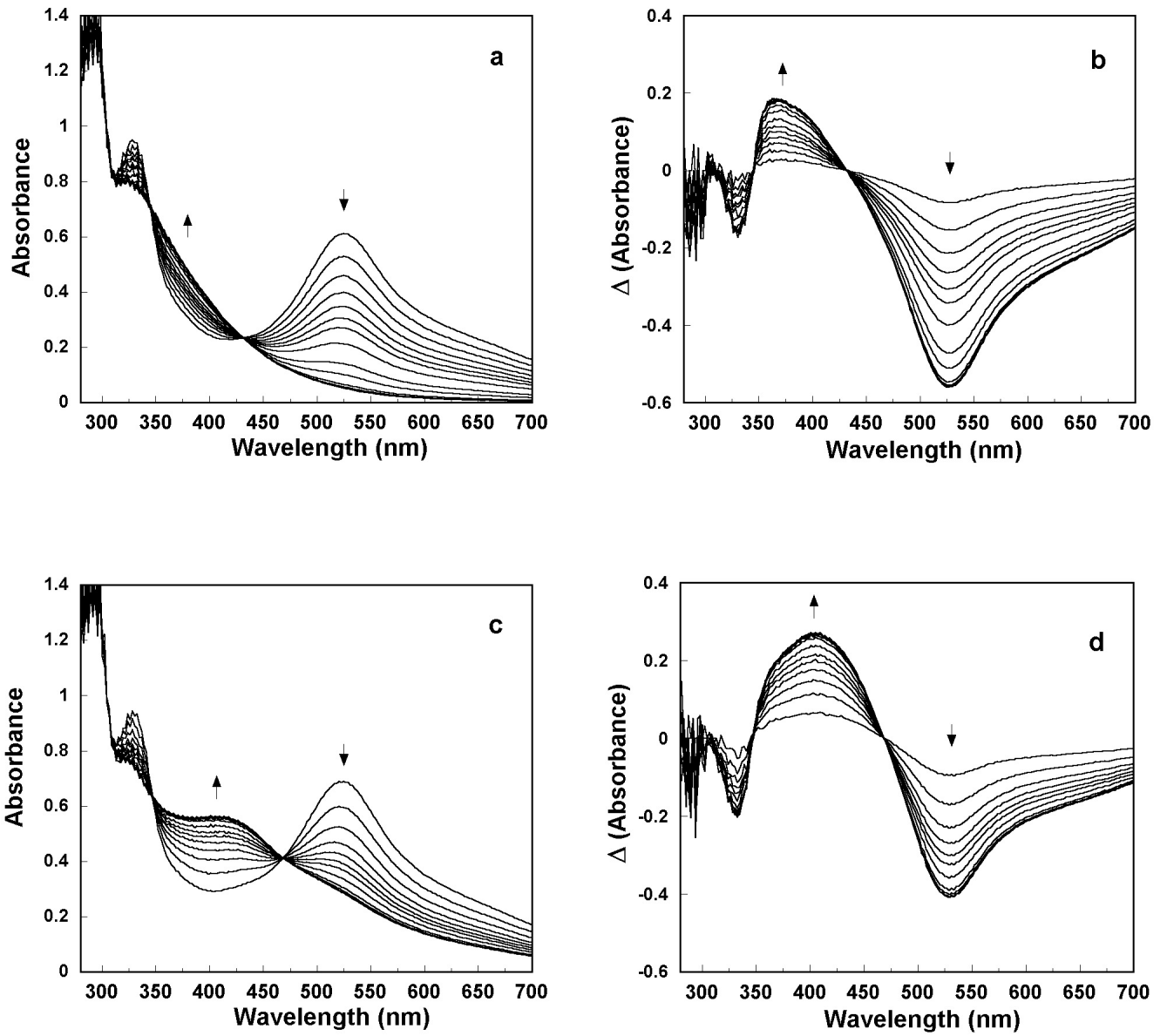

Figure 1:

Time dependence of DPPH° (7.7×10^{-5} M) absorption spectra upon reaction with excess TrOH (7.75×10^{-4} M) in 1/1 ethanol/buffer mixtures. The buffer pH was 6.4 (a, b) or 8.4 (c, d). The absolute spectra (a, c) were recorded 0.006, 0.018, 0.030, 0.042, 0.055, 0.067, 0.079, 0.103, 0.152, 0.201, 0.310, 0.407, 0.492, 0.809, 1.00, 1.50, 2.43 s after mixing. The difference spectra (b, d) are derived from absolute spectra by subtracting the initial spectrum to subsequent spectra. The arrows indicate direction of the absorption changes.

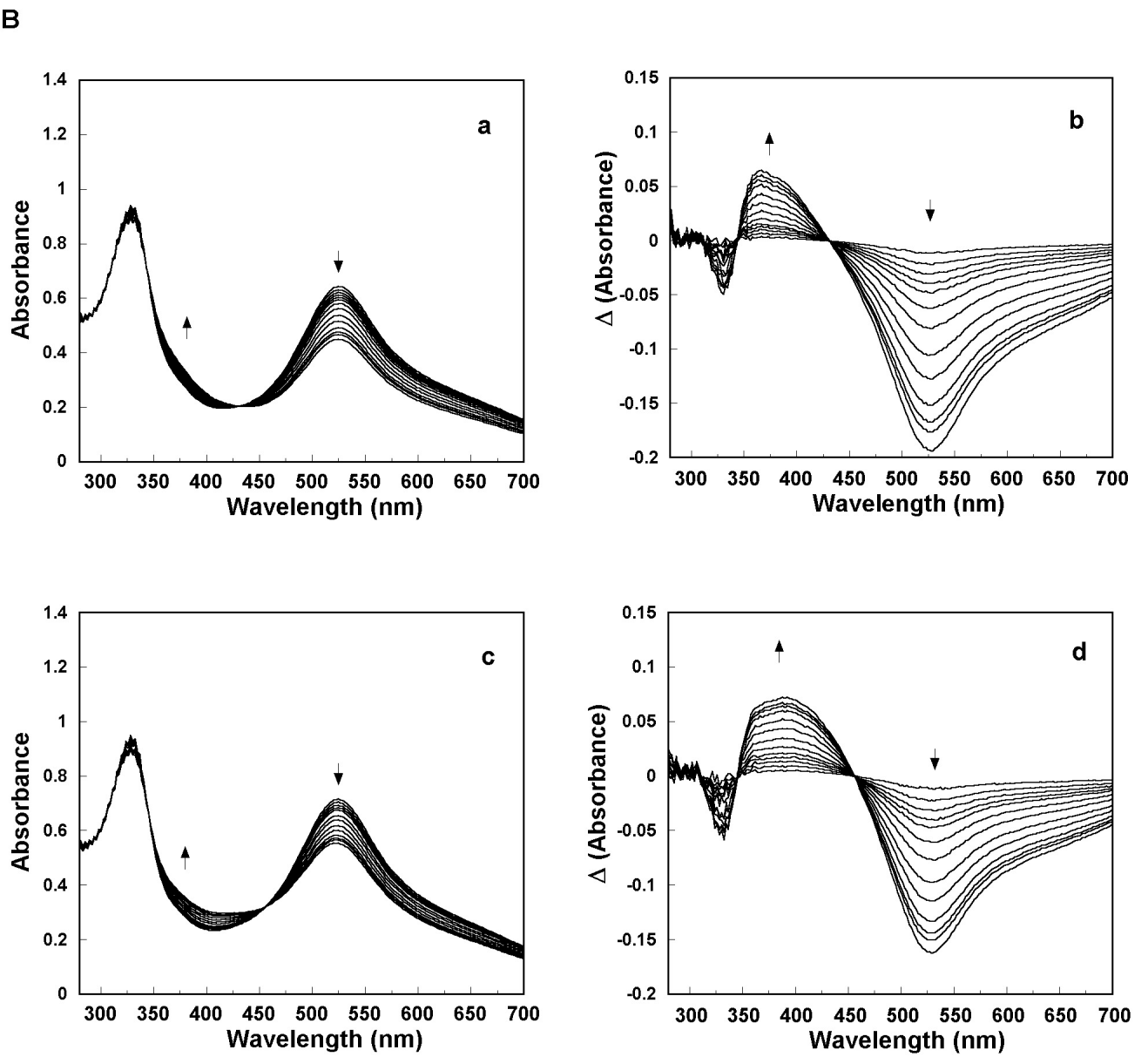

Figure 2:

Time dependence of DPPH° (7.5×10^{-5} M) absorption spectra upon reaction with default TrOH (7.8×10^{-6} M) in 1/1 ethanol/buffer mixtures. The buffer pH was 6.4 (a, b) or 8.4 (c, d). The absolute spectra were recorded 0.049, 0.146, 0.243, 0.340, 0.438, 0.535, 0.730, 1.02, 1.51, 2.09, 3.06, 4.04, 5.01, 10.07 s after mixing. The difference spectra (b, d) are derived from absolute spectra by subtracting the initial spectrum to subsequent spectra. The arrows indicate direction of the absorption changes.

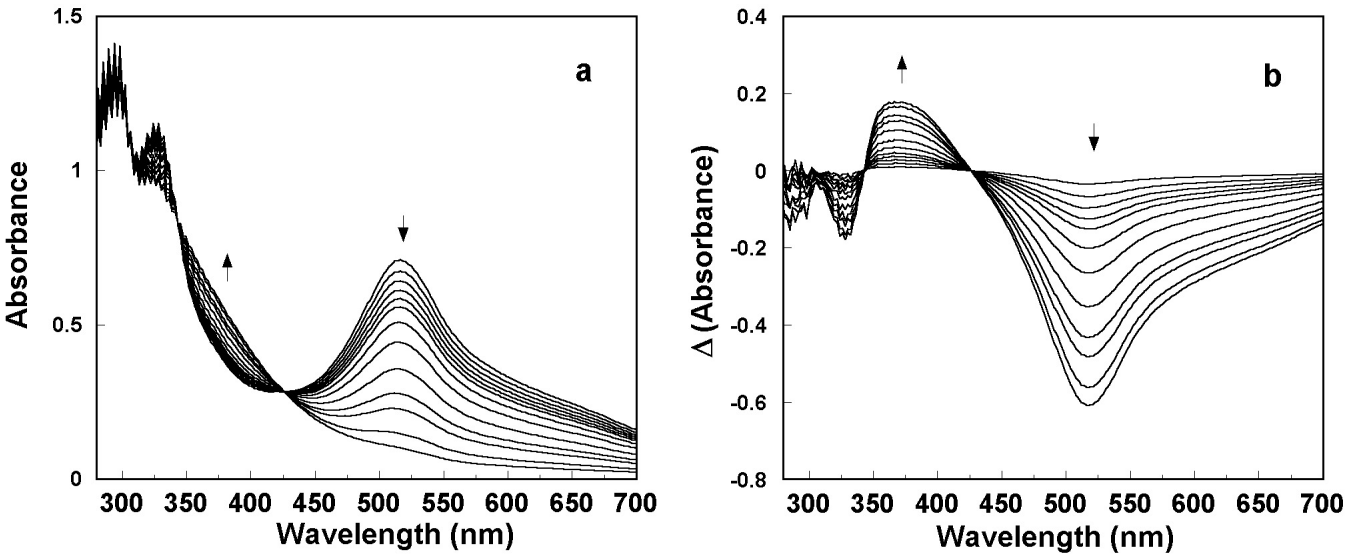

Figure 3:

Time dependence of DPPH° (7.6 x10^{-5} M) absorption spectra upon reaction with excess TrOH (7.5x10^{-4} M) in 100% ethanol. The absolute spectra were recorded 0.097, 0.292, 0.486, 0.681, 0.876, 1.070, 1.459, 2.043, 3.016, 4.183, 5.156, 7.491, 10.02 s after mixing. Difference spectra derived from absolute spectra by subtracting the initial spectrum to subsequent spectra. The arrows indicate direction of the absorption changes.