Supporting Information

Electrolysis of Trichloromethylated Organic Compounds under Aerobic Conditions Catalyzed by B_{12} Model Complex for Ester and Amide Formations

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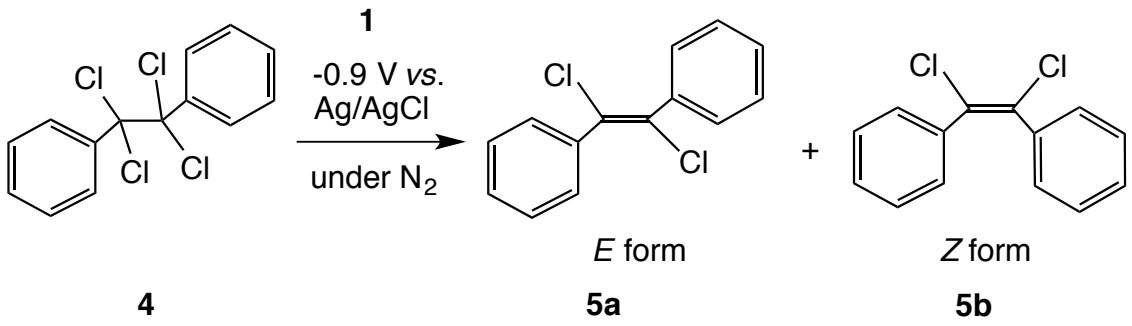
Electrolysis of 1,1,2,2-tetrachloro-1,2-diphenylethane (4) catalyzed by B_{12} model complex (1).



The controlled-potential electrolysis of 1,1,2,2-tetrachloro-1,2-diphenylethane (**4**) was carried out in a one-compartment cell equipped with a Pt mesh cathode and a zinc plate anode (1x3 cm^2) at -0.9 V *vs*. Ag/AgCl in the presence of **1** at room temperature in 0.1 M *n*-Bu_4NClO_4 containing ethanol under N_2. The zinc electrode was used as a sacrificial anode. The applied potential between the working and reference electrodes in the electrolysis was maintained constant using a Hokuto Denko HA BF-501A potentiostat, and the electrical quantity was also recorded by it. The concentrations of the catalyst and substrate were $5.0x10^{-4}$ M and $5.0x10^{-3}$ M, respectively. After the electrolysis, the electrolyte solution was passed through in silica gel with $CHCl_3$ eluent, then analyzed by GC-MS. Conversion of **4**: 77%, yields of **5a**: 11%, yields of **5b**: 47%.

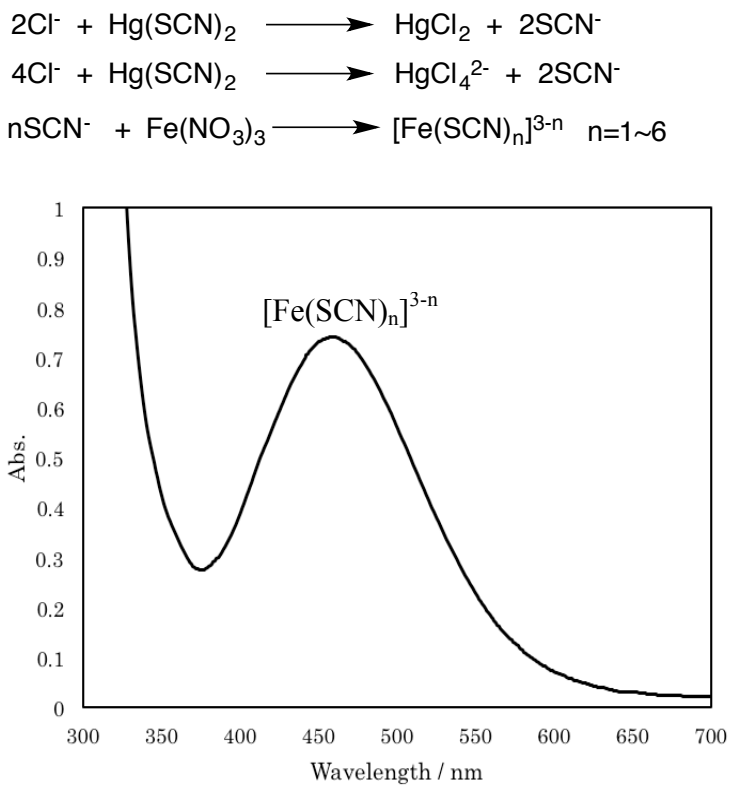


Figure S1. UV-vis absorption spectrum of mercury (II) thiocyanate reagent with aerobic electrolysis solution.

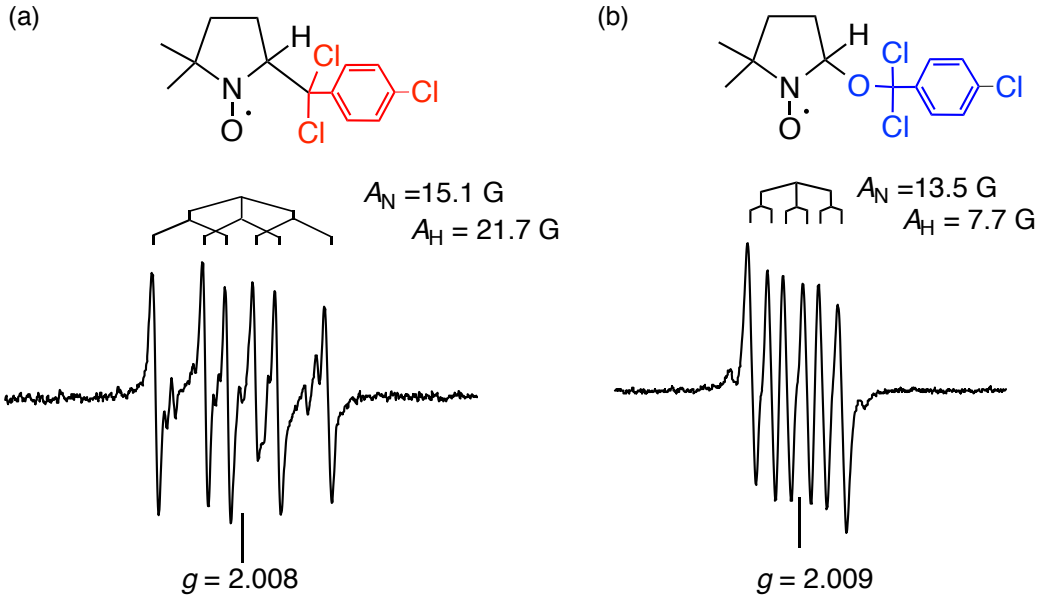


Figure S2. ESR spectra observed during the electrolysis at -0.9 V *vs*. Ag/AgCl in C_2H_5OH; [**1**]=5x10^{-4} M; [4-chloro-benzotrichloride]=5.0x10^{-2} M; [DMPO]=2.5x10^{-1} M; [*n*-Bu_4NClO_4]=1x10^{-1} M under N_2 (a) and air (b).

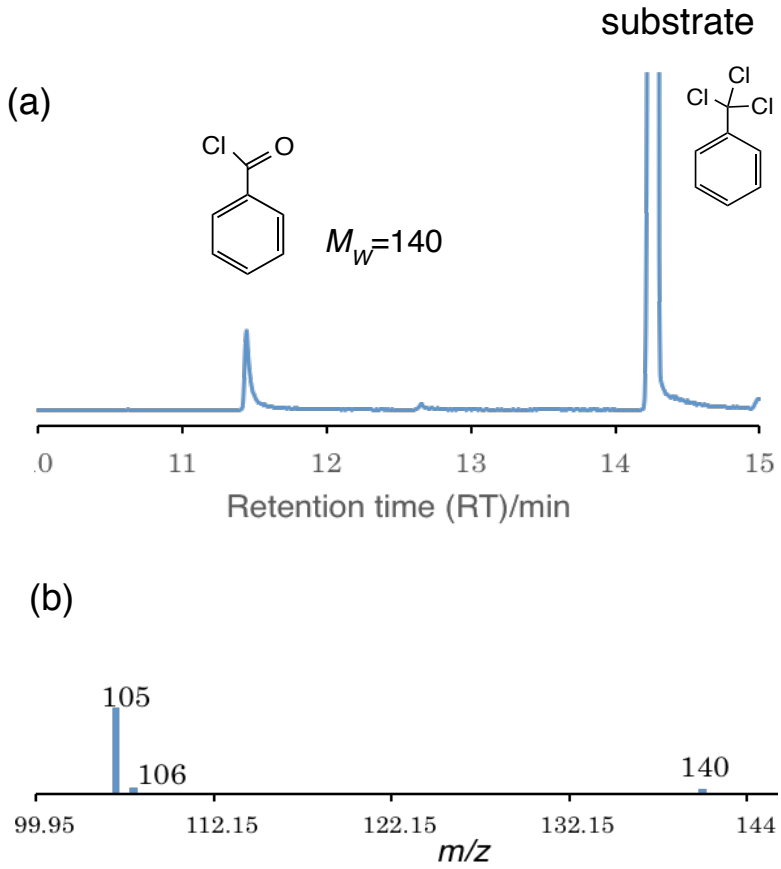


Figure S3. (a) GS-MS of B_{12} model complex (**1**) catalyzed reaction mixture after a 1h electrolysis in CH_3CN under air, (b) mass pattern of RT=11.4 min. peak.

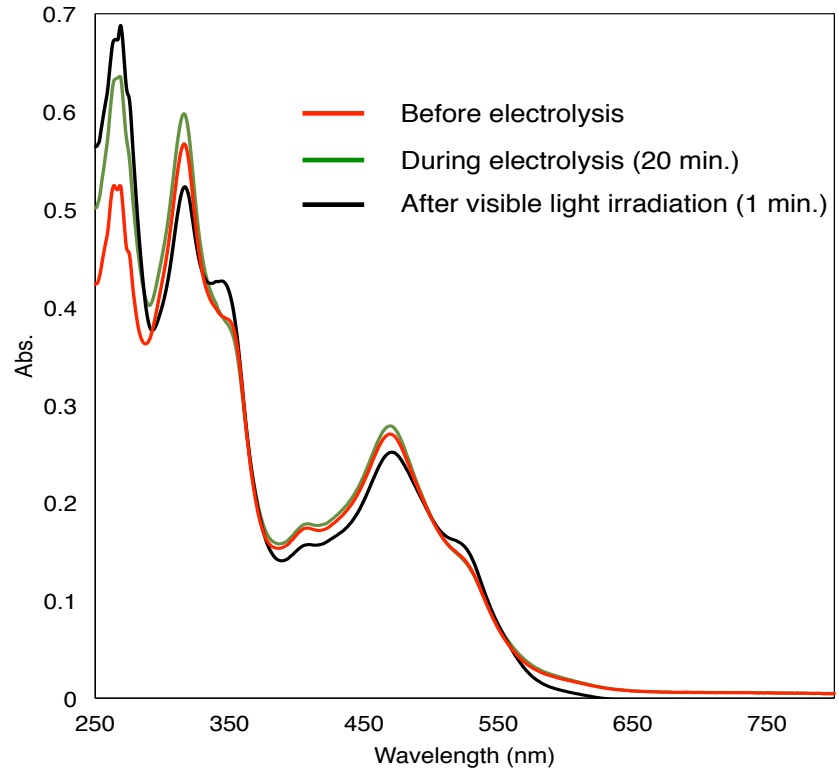


Figure S4. UV-vis spectral changes during electrolysis at -0.9 V *vs*. Ag/AgCl under N_2: [**1**]=3.2x10^{-4} M, [benzotrichloride]=3.2x10^{-2} M, [*n*-Bu_4NClO_4]=1x10^{-1} M in C_2H_5OH.