Document: Synthesis and Characterization of [Fe(CN)6]3–/4– Redox Couple in Ionic Liquids

Abstract:
We report cyclic voltammetry of ferrocyanide/ferricyanide in 1-ethyl-3-methylimidazolium tetrafluoroborate ([EMIM][BF4]). Observed ΔE■ = 75 mV at ν = 100 mV/s; diffusion coefficient D calculated via Randles–Šev■ík:

$$i_p = (2.69\times10^5)\cdot n^{3/2}\cdot A\cdot C\cdot D^{1/2}\cdot \nu^{1/2}$$

Table 1:

scan rate (mV/s)	E_pa (V vs. Ag/AgCl)	E_pc (V vs. Ag/AgCl)	ΔE_p (mV)
50	0.225	0.150	75
100	0.230	0.155	75
200	0.235	0.160	75

Conclusion: IL viscosity η ≈ 250 cP at 25 °C retards diffusion; D ≈ 2.3×10■■ cm²/s.