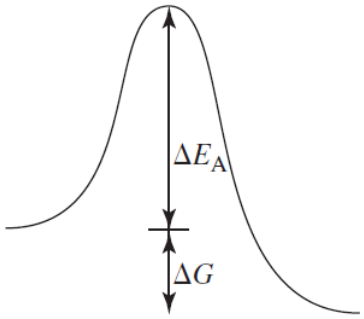
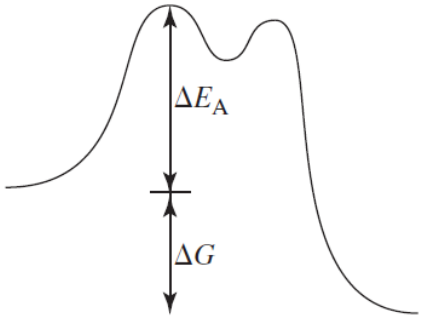
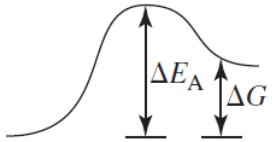


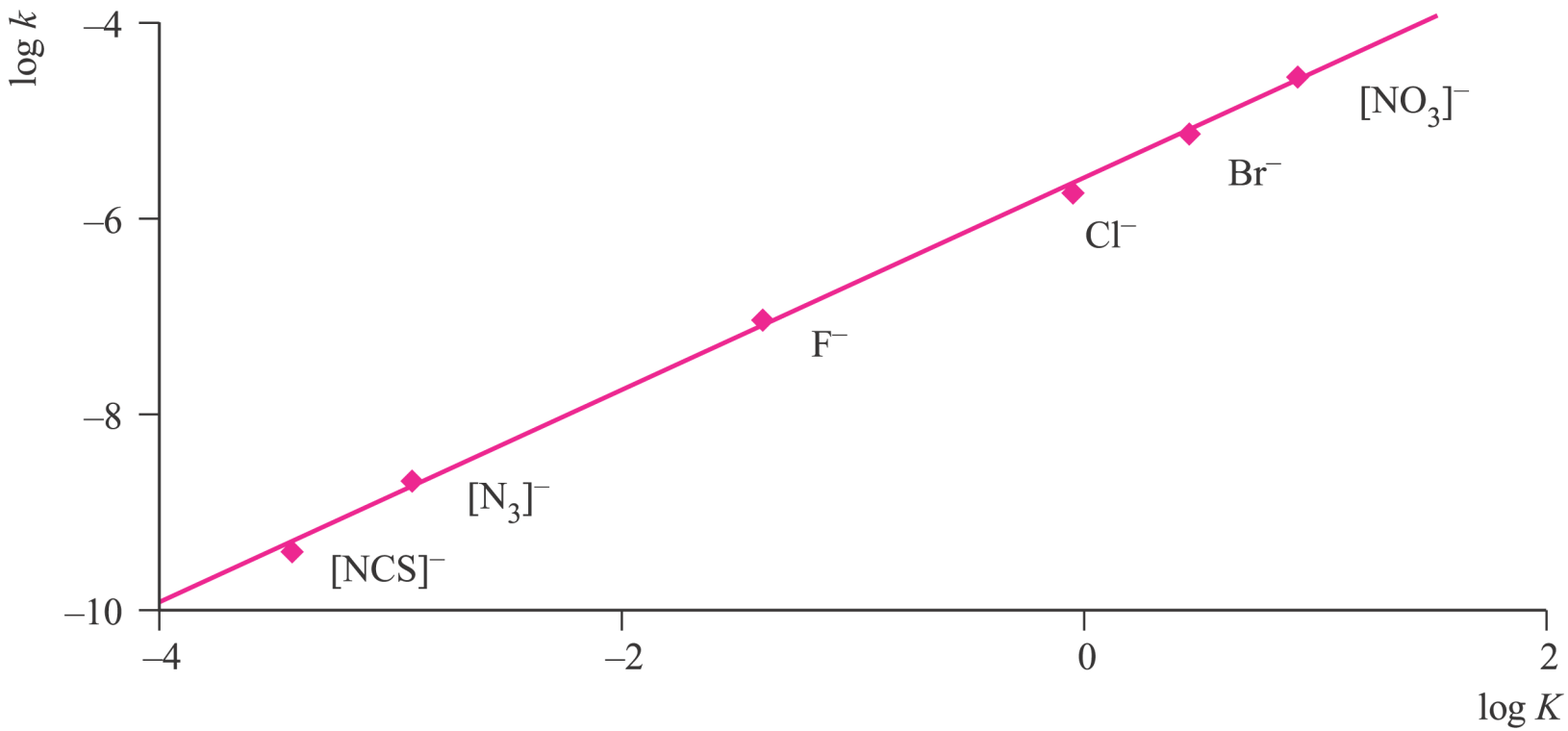
(a)

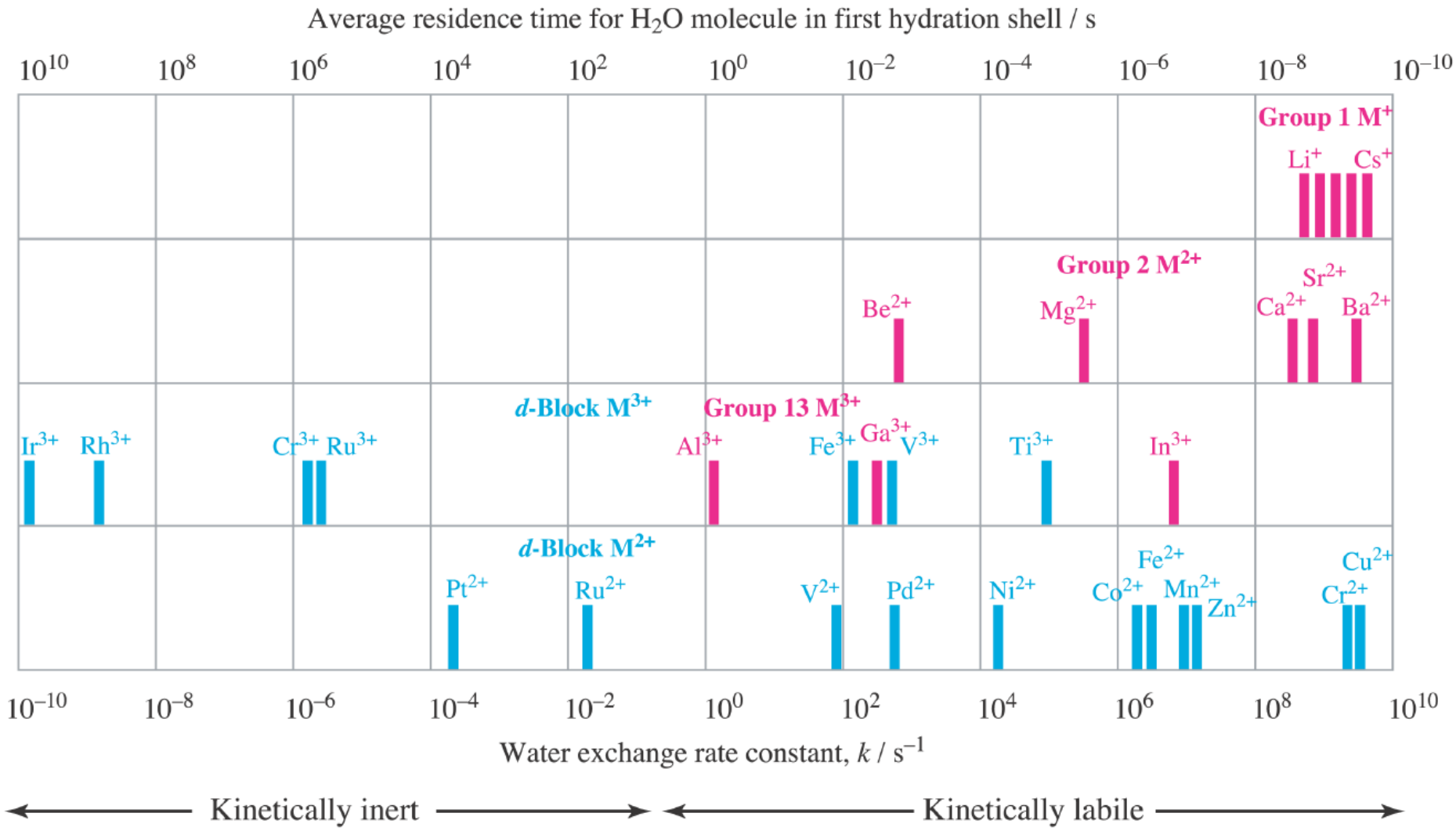


(b)



(c)


log k
–4
–6
–8
–10
–4
–2
0
2
log K
[NCS]⁻
[N3]⁻
F⁻
Cl⁻
Br⁻
[NO3]⁻


Average residence time for H_2O molecule in first hydration shell / s
10^{10} 10^{8} 10^{6} 10^{4} 10^{2} 10^{0} 10^{-2} 10^{-4} 10^{-6} 10^{-8} 10^{-10}
Group 1 M^+
Li^+ Cs^+
Group 2 M^{2+}
Sr^{2+}
Be^{2+} Mg^{2+} Ca^{2+} Ba^{2+}
Ir^{3+} Rh^{3+}
Cr^{3+} Ru^{3+}
d-Block M^{3+}
Group 13 M^{3+}
Al^{3+} Fe^{3+} Ga^{3+} V^{3+}
Ti^{3+}
In^{3+}
d-Block M^{2+}
Pt^{2+} Ru^{2+} V^{2+} Pd^{2+} Ni^{2+} Fe^{2+} Co^{2+} Mn^{2+} Zn^{2+} Cu^{2+} Cr^{2+}
10^{-10} 10^{-8} 10^{-6} 10^{-4} 10^{-2} 10^{0} 10^{2} 10^{4} 10^{6} 10^{8} 10^{10}
Water exchange rate constant, k / s^{-1}
Kinetically inert
Kinetically labile

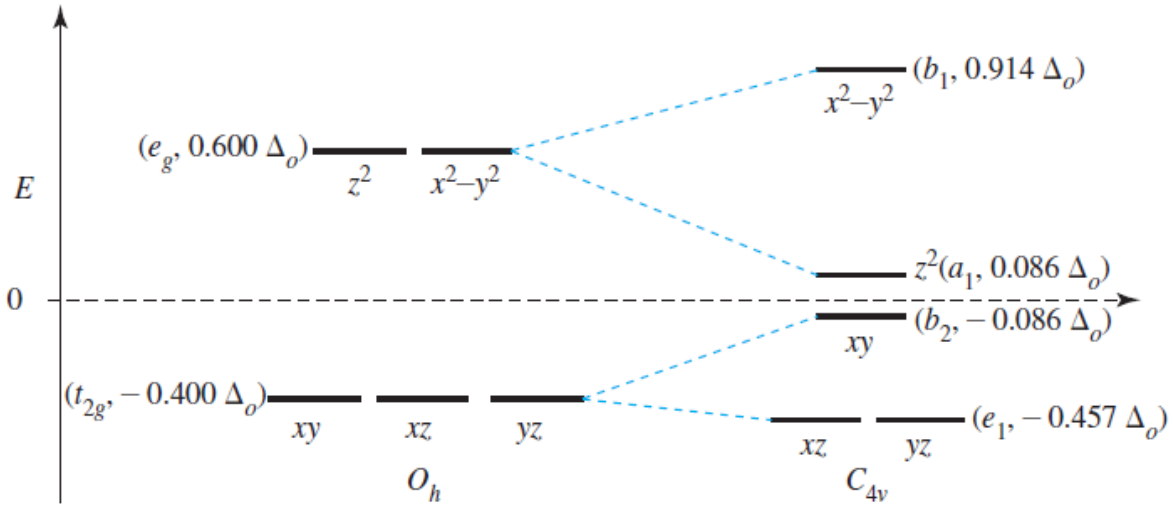


TABLE 12.3 Ligand Field Activation Energies

	Strong Fields (units of Δ_o)			Weak Fields (units of Δ_o)		
System	Octahedral LFSE	Square-Pyramidal LFSE	LFAE	Octahedral LFSE	Square-Pyramidal LFSE	LFAE
d^0	0	0	0	0	0	0
d^1	–0.400	–0.457	–0.057	–0.400	–0.457	–0.057
d^2	–0.800	–0.914	–0.114	–0.800	–0.914	–0.114
d^3	–1.200	–1.000	0.200	–1.200	–1.000	0.200
d^4	–1.600	–0.914	0.686	–0.600	–0.914	–0.314
d^5	–2.000	–1.371	0.629	0	0	0
d^6	–2.400	–1.828	0.572	–0.400	–0.457	–0.057
d^7	–1.800	–1.914	–0.114	–0.800	–0.914	–0.114
d^8	–1.200	–1.828	–0.628	–1.200	–1.000	0.200
d^9	–0.600	–0.914	–0.314	–0.600	–0.914	–0.314
d^{10}	0	0	0	0	0	0

For a square-pyramidal transition state, LFAE = square pyramid LFSE – Octahedral LFSE, for σ donor only.