CHEM1109 (Life Sciences Course) - November 2007

2007-N-2

- 56.5 kJ mol^{-1}

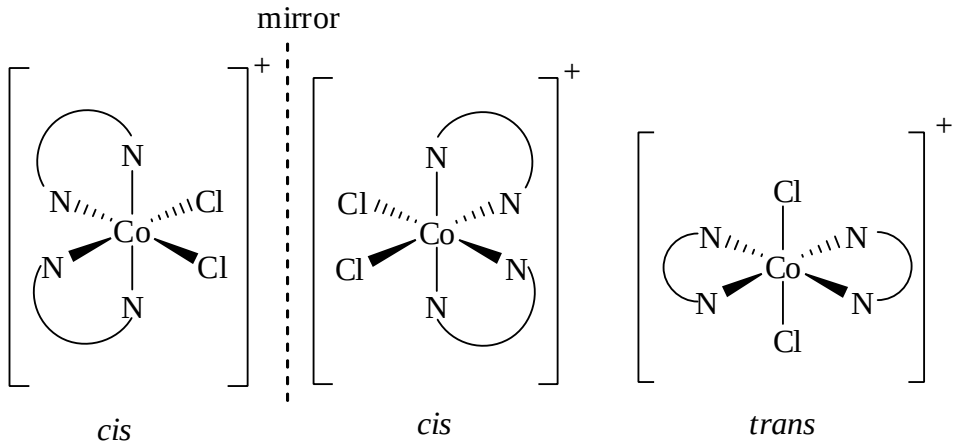
  0.60

- 0.26 mol

2007-N-3

- 20 mmHg

  decrease

- 

  cis *cis* *trans*

  dichlorobisethylenediaminecobalt(III) ion

2007-N-4

- $\Delta G° = \Delta H° - T\Delta S°$
  $= -198.4 - (298 \times -187.9) \times 10^{-3}$
  $= -142.4$ kJ mol^{-1}

  As $\Delta G°$ is negative, the reaction is spontaneous

  To the left

  $K = 9.15 \times 10^{24}$

  $T > 1056$ K

2007-N-5

- 33.6 kJ g^{-1}

2007-N-6

- 1.40×10^4 g mol^{-1}
- 334 g

2007-N-7

- $K = 6.52 \times 10^2$

  86.2%

  (i) add more glucose (ii) decrease the temperature

  (removing either (or both) of the products isn't really simple)

2007-N-8

- $Zn^{2+}(aq) + 4CN^-(aq) \rightleftharpoons [Zn(CN)_4]^{2-}(aq)$

  2.9×10^{-21} M

  tetracyanozincate(II) ion

- 3.44 s

2007-N-9

- 0.51 V

  0.24 V

  (b) $Ag^+(aq)$ ions are produced. They will react with the $Cl^-(aq)$ ions in solution and a white precipitate of AgCl will be seen to form around the electrode.

2007-N-10

- Colloids can be stabilised electrostatically - like charges on the surface of the particles cause the particles to repel each other. The addition of electrolytes neutralises these surface charges and the particles can now come together.
- 1.2 g Cu 0.30 g O_2

2007-N-11

- pH = 0.94

2007-N-12

- 1.04 V

  1.51×10^{35}

  –201 kJ mol^{-1}

  $Ni(s) | Ni^{2+}(aq) || Ag^+(aq) | Ag(s)$

2007-N-13

- Rate = $k[CO][Cl_2]$

  $k = 1.29 \times 10^{-28}$ L mol^{-1} s^{-1}

  2.2×10^{-28} M s^{-1}