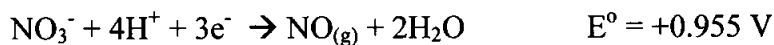


CH302H – Principles of Chemistry II: Honors
Spring 2014, Unique 51880

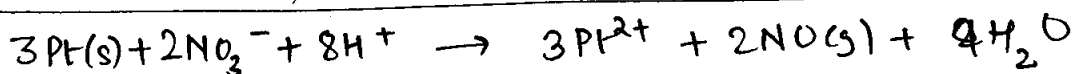
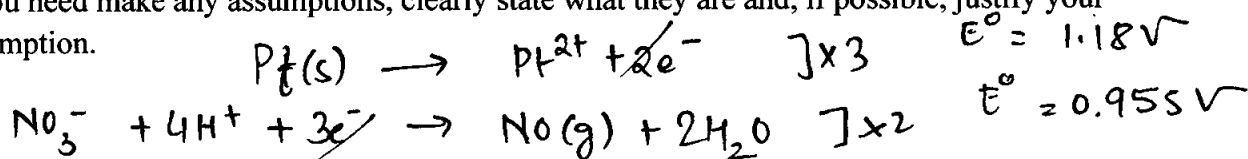
Bonus Quiz
22 April 2014

Pt is nearly always treated as an inert electrode. Nitric acid is, however considered a strong oxidizing agent. Is Pt “safe” in a nitric acid solution, or will it dissolve away?

- Write the balance reaction for this redox reaction.
- Tell me to what extent a Pt wire would dissolve in a 1 M HNO₃ solution. (i.e., what is [Pt²⁺] in 1 M HNO₃?)



If you need make any assumptions, clearly state what they are and, if possible, justify your assumption.



Assuming reaction reaches equilibrium

$$E^\circ_{\text{cell}} = \frac{0.059}{n} \log K$$

$$(0.955 - 1.18) = \frac{0.059}{6} \log \left(\frac{[\text{Pt}^{2+}]^3}{[\text{NO}_3^-]^2 [\text{H}^+]^8} \right)$$

$$-0.225 = 0.00983 \log [\text{Pt}^{2+}]^3$$

$$[\text{Pt}^{2+}]^3 = 1.314 \times 10^{-23}$$

$$[\text{Pt}^{2+}] = 2.36 \times 10^{-8} \text{ M}$$