CH 223
Sample Quiz #5 Name: _____ Lab Section: _____

Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.

Question #1: (5 points) One kind of battery used in watches contains mercury(II) oxide. As current flows, the mercury(II) oxide is reduced to mercury: **$HgO(s) + H_2O(l) + 2\ e^- \rightarrow Hg(l) + 2\ OH^-(aq)$**

If 2.3×10^{-5} amperes flows continuously for 1200 days, what mass of $Hg(l)$ is produced?

Question #2: (5 points) Write a balanced chemical equation for the following reaction in an **acidic** solution.

$Cr_2O_7^{2-}(aq) + Ni(s) \rightarrow Cr^{3+}(aq) + Ni^{2+}(aq)$

Question #3: (10 points) Write a balanced spontaneous reaction using the following electrochemical values and calculate the E_{cell} potential in volts.

$F_2(g) + 2e^- \rightarrow 2\ F^-(aq)$ $E° = 2.87$ V
$Al^{3+}(aq) + 3e^- \rightarrow Al(s)$ $E° = -1.66$ V

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Answers
Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.

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If 2.3×10^{-5} amperes flows continuously for 1200 days, what mass of Hg(l) is produced?

2.5 g

Question #2: (5 points) Write a balanced chemical equation for the following reaction in an **acidic** solution.
$Cr_2O_7^{2-}(aq) + Ni(s) \rightarrow Cr^{3+}(aq) + Ni^{2+}(aq)$

$Cr_2O_7^{2-}(aq) + 14\ H^+(aq) + 3\ Ni(s) \rightarrow 2\ Cr^{3+}(aq) + 7\ H_2O(l) + 3\ Ni^{2+}(aq)$

Question #3: (10 points) Write a balanced spontaneous reaction using the following electrochemical values and calculate the E_{cell} potential in volts.

$F_2(g) + 2e^- \rightarrow 2\ F^-(aq)$ $E° = 2.87$ V
$Al^{3+}(aq) + 3e^- \rightarrow Al(s)$ $E° = -1.66$ V

$3\ F_2(g) + 2\ Al(s) \rightarrow 2\ Al^{3+}(aq) + 6\ F^-(aq)$ $E_{cell} =$ **4.53 V**