Supplemental Instruction
Iowa State University
Exam II

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<td>Course:</td>
<td>CHEM 177</td>
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Review Game

1. Strong acid/base game
   2. Oxidation number game

1. (#8 from practice exam)

Aluminum burns in bromine liquid, producing aluminum bromide. In one experiment, 6.0 g of aluminum reacted with an excess of bromine to yield 50.3 g aluminum bromide. Calculate the percent yield for the aluminum bromide

\[
2 \text{ Al(s)} + 3 \text{ Br}_2(\text{l}) \rightarrow 2 \text{ AlBr}_3(\text{s})
\]

A) 84.8% B) 59.3% C) 48.9% D) 25.1%

2. (#7 from practice exam)

In a self-contained breathing apparatus, potassium superoxide, KO_2, reacts with CO_2 to produce potassium carbonate and oxygen:

\[
4\text{KO}_2(\text{s}) + 2\text{CO}_2(\text{g}) \rightarrow 2\text{K}_2\text{CO}_3(\text{s}) + 3\text{O}_2(\text{g})
\]

How much oxygen (in grams) could be produced from 5.00 g of KO_2 and 4.50 g of CO_2?

A) 0.0528g B) 0.481g C) 1.69g D) 15.4g

3. (#13 from practice exam)

Hydrochloric acid is obtained in 12.0 M stock solution. What volume of stock solution is required to make 500.0 mL of a 0.145 M dilute solution?

A) 6.10x10^-3 mL B) 6.04 mL C) 72.5 mL D) 4.14x10^4 mL

4. (#15 from practice exam)
What is the concentration of 21.50 mL H₂SO₄ solution that requires 45.50 mL of 0.260 M NaOH to react completely?

\[ \text{H}_2\text{SO}_4(\text{aq}) + 2 \text{NaOH}(\text{aq}) \rightarrow \text{Na}_2\text{SO}_4(\text{aq}) + 2 \text{H}_2\text{O}(l) \]

A) 0.006 M (B) 0.118 M (C) 0.275 M (D) 5.912 M

5. (#12 from practice exam)

The net-ionic equation for the formation of an aqueous solution of NiCl₂ accompanied by evolution of CO₂ gas after mixing solid NiCO₃ and aqueous hydrochloric acid is ____.

A. \[ \text{NiCO}_3(\text{s}) + 2\text{HCl}(\text{aq})\rightarrow \text{H}_2\text{O}(l) + \text{CO}_2(\text{g}) + \text{Ni}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \]

B. \[ \text{NiCO}_3(\text{s}) + 2\text{H}^+(\text{aq})\rightarrow \text{H}_2\text{O}(l) + \text{CO}_2(\text{g}) + \text{Ni}^{2+}(\text{aq}) \]

C. \[ \text{NiCO}_3(\text{s}) + \text{I}^-(\text{aq})\rightarrow 2\text{H}_2\text{O}(l) + \text{CO}_2(\text{g}) + \text{Ni}^{2+}(\text{aq}) + \text{HI}(\text{aq}) \]

D. \[ \text{NiCO}_3(\text{s}) + 2\text{HI}(\text{aq})\rightarrow 2\text{H}_2\text{O}(l) + \text{CO}_2(\text{g}) + \text{NiI}_2(\text{aq}) \]