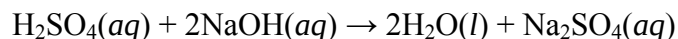


1. Which of the following is a strong base?



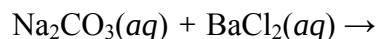
- A. NH_3
- B. Ca(OH)_2
- C. Al(OH)_3
- D. B(OH)_3
- E. CH_3OH

2. Automobile batteries use 3.0 M H_2SO_4 as an electrolyte. How much 1.20 M NaOH will be needed to neutralize 225 mL of battery acid?



- A. 0.045 L
- B. 0.28 L
- C. 0.56 L
- D. 0.90 L
- E. 1.1 L

6. Select the precipitate that forms when the following reactants are mixed.

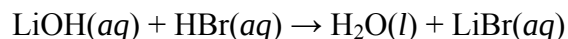


- A. Ba_2CO_3
- B. BaCO_3
- C. NaCl
- D. NaCl_2
- E. BaO

7. Calculate the oxidation number of the chlorine in perchloric acid, HClO_4 , a strong oxidizing agent.

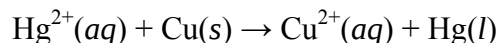
- A. -1
- B. +4
- C. +5
- D. +7
- E. none of these is the correct oxidation number

8. Select the net ionic equation for the reaction between lithium hydroxide and hydrobromic acid.



- A. $\text{LiOH}(aq) \rightarrow \text{Li}^+(aq) + \text{OH}^-(aq)$
- B. $\text{HBr}(aq) \rightarrow \text{H}^+(aq) + \text{Br}^-(aq)$
- C. $\text{H}^+(aq) + \text{OH}^-(aq) \rightarrow \text{H}_2\text{O}(l)$
- D. $\text{Li}^+(aq) + \text{Br}^-(aq) \rightarrow \text{LiBr}(aq)$
- E. $\text{Li}^+(aq) + \text{OH}^-(aq) + \text{H}^+(aq) + \text{Br}^-(aq) \rightarrow \text{H}_2\text{O}(l) + \text{LiBr}(aq)$

9. Identify the oxidizing agent in the following redox reaction.



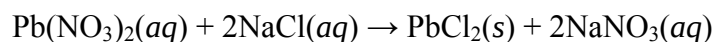
- A. $\text{Hg}^{2+}(aq)$
- B. $\text{Cu}(s)$

- C. $\text{Cu}^{2+}(\text{aq})$
- D. $\text{Hg}(\text{l})$
- E. $\text{Hg}^{2+}(\text{aq})$ and $\text{Cu}^{2+}(\text{aq})$

11. Select the correct name and chemical formula for the precipitate that forms when the following reactants are mixed.



- A. cobalt(II) phosphate, $\text{Co}_3(\text{PO}_4)_2$
 - B. cobalt(III) phosphate, $\text{Co}_3(\text{PO}_4)_2$
 - C. cobalt(II) phosphate, CoPO_4
 - D. cobalt(III) phosphate, CoPO_4
 - E. ammonium sulfate, $(\text{NH}_4)_2\text{SO}_4$
14. How many moles of $\text{H}^+(aq)$ ions are present in 750 mL of 0.65 M hydrochloric acid?
- A. 1.2 mol
 - B. 0.98 mol
 - C. 0.87 mol
 - D. 0.65 mol
 - E. 0.49 mol
15. In the following reaction, what ions, if any, are spectator ions?



- A. $\text{Pb}^{2+}(aq)$, $\text{Cl}^-(aq)$
- B. $\text{Na}^+(aq)$, $\text{NO}_3^-(aq)$
- C. $\text{Pb}^{2+}(aq)$, $\text{NO}_3^-(aq)$
- D. $\text{Na}^+(aq)$, $\text{Cl}^-(aq)$
- E. There are no spectator ions

21. Potassium chloride, KCl, sodium sulfate, Na_2SO_4 , glucose, $\text{C}_6\text{H}_{12}\text{O}_6$, carbon dioxide, CO_2 and ammonium phosphate, $(\text{NH}_4)_3\text{PO}_4$, are soluble in water. Which one produces the largest number of dissolved particles per mole of dissolved solute?

- A. KCl
- B. Na_2SO_4
- C. $\text{C}_6\text{H}_{12}\text{O}_6$
- D. CO_2
- E. $(\text{NH}_4)_3\text{PO}_4$

24. Which of the following is a weak acid?

- A. H_2SO_4
- B. HNO_3
- C. HF
- D. HBr
- E. HCl