

solustoich

Name \_\_\_\_\_

1. A 20.0–milliliter sample of 0.200–molar  $\text{K}_2\text{CO}_3$  solution is added to 30.0 milliliters of 0.400–molar  $\text{Ba}(\text{NO}_3)_2$  solution. Barium carbonate precipitates. The concentration of barium ion,  $\text{Ba}^{2+}$ , in solution after reaction is

- (A) 0.150 M
- (B) 0.160 M
- (C) 0.200 M
- (D) 0.240 M
- (E) 0.267 M

2.  $5 \text{Fe}^{2+} + \text{MnO}_4^- + 8 \text{H}^+ \rightleftharpoons 5 \text{Fe}^{3+} + \text{Mn}^{2+} + 4 \text{H}_2\text{O}$

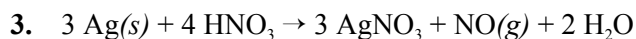
In a titration experiment based on the equation above, 25.0 milliliters of an acidified  $\text{Fe}^{2+}$  solution requires 14.0 milliliters of standard 0.050–molar  $\text{MnO}_4^-$  solution to reach the equivalence point. The concentration of  $\text{Fe}^{2+}$  in the original solution is

- (A) 0.0010 M
- (B) 0.0056 M
- (C) 0.0028 M
- (D) 0.0090 M
- (E) 0.14 M



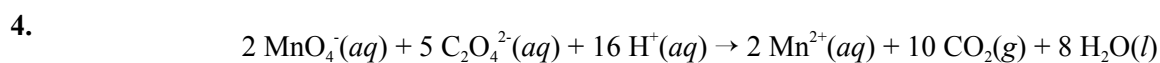
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The reaction of silver metal and dilute nitric acid proceeds according to the equation above. If 0.10 mole of powdered silver is added to 10. milliliters of 6.0-molar nitric acid, the number of moles of NO gas that can be formed is

- (A) 0.015 mole
- (B) 0.020 mole
- (C) 0.030 mole
- (D) 0.045
- (E) 0.090
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Permanganate and oxalate ions react in an acidified solution according to the balanced equation above. How many moles of  $\text{CO}_2(g)$  are produced when 20. mL of acidified 0.20 M  $\text{KMnO}_4$  solution is added to 50. mL of 0.10 M  $\text{Na}_2\text{C}_2\text{O}_4$  solution?

- (A) 0.0040 mol
- (B) 0.0050 mol
- (C) 0.0090 mol
- (D) 0.010 mol
- (E) 0.020 mol
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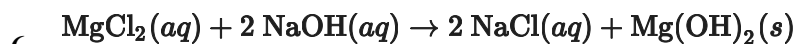


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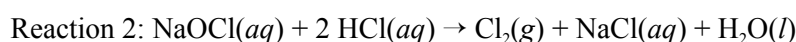
According to the balanced equation above, how many moles of  $\text{ClO}_2^-(aq)$  are needed to react completely with 20. mL of 0.20 M  $\text{KMnO}_4$  solution?

- (A) 0.0030 mol
- (B) 0.0053 mol
- (C) 0.0075 mol
- (D) 0.013 mol
- (E) 0.030 mol



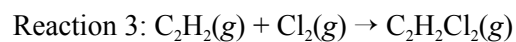
A 100 mL sample of 0.1 M  $\text{MgCl}_2(aq)$  and a 100 mL sample of 0.2 M  $\text{NaOH}(aq)$  were combined, and  $\text{Mg}(\text{OH})_2(s)$  precipitated, as shown by the equation above. If the experiment is repeated using solutions of the same molarity, which of the following changes in volume will double the amount of  $\text{Mg}(\text{OH})_2(s)$  produced?

- (A) Using the same volume of  $\text{MgCl}_2(aq)$  but twice the volume of  $\text{NaOH}(aq)$
- (B) Using twice the volume of  $\text{MgCl}_2(aq)$  but half the volume of  $\text{NaOH}(aq)$
- (C) Using twice the volume of  $\text{MgCl}_2(aq)$  but the same volume of  $\text{NaOH}(aq)$
- (D) Using twice the volume of  $\text{MgCl}_2(aq)$  and twice the volume of  $\text{NaOH}(aq)$



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7. Reaction 2 occurs when an excess of 6 M  $\text{HCl}(\text{aq})$  solution is added to 100. mL of  $\text{NaOCl}(\text{aq})$  of unknown concentration. If the reaction goes to completion and 0.010 mol of  $\text{Cl}_2(\text{g})$  is produced, then what was the molarity of the  $\text{NaOCl}(\text{aq})$  solution?

- (A) 0.0010 M
- (B) 0.010 M
- (C) 0.10 M
- (D) 1.0 M
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