Solquiz

1. A 20. mL sample of 0.50 M $HC_2H_3O_2(aq)$ is titrated with 0.50 M NaOH(aq). Which of the following best represents the species that react and the species produced in the reaction?

(A) $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$

(B) $H^+(aq) + C_2H_3O_2^-(aq) + Na^+(aq) + OH^-(aq) \rightarrow H_2O(l) + NaC_2H_3O_2(aq)$

(C) $HC_2H_3O_2(aq) + OH^-(aq) \rightarrow C_2H_3O_2^-(aq) + H_2O(l)$ ✓

(D) $HC_2H_3O_2(aq) + NaOH(aq) \rightarrow H_2O(l) + Na^+(aq) + C_2H_3O_2^-(aq)$

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2. A student wishes to prepare 2.00 liters of 0.100–molar KIO_3 (molecular weight 214). The proper procedure is to weigh out

(A) 42.8 grams of KIO_3 and add 2.00 kilograms of H_2O

(B) 42.8 grams of KIO_3 and add H_2O until the final homogeneous solution has a volume of 2.00 liters ✓

(C) 21.4 grams of KIO_3 and add H_2O until the final homogeneous solution has a volume of 2.00 liters

(D) 42.8 grams of KIO_3 and add 2.00 liters of H_2O

(E) 21.4 grams of KIO_3 and add 2.00 liters of H_2O

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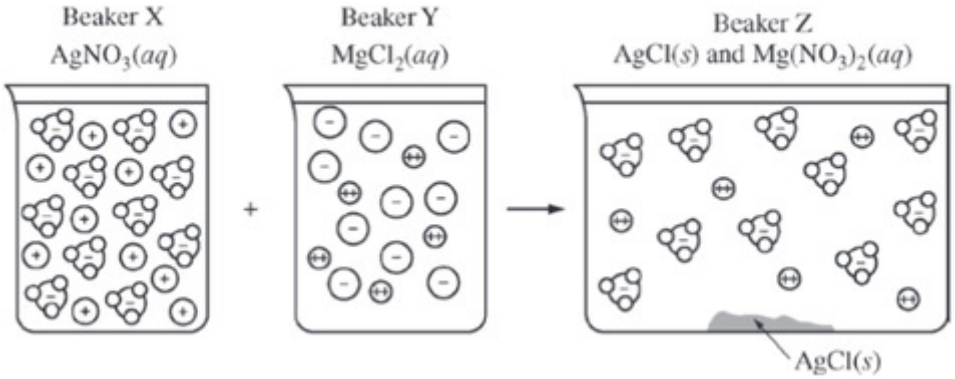
3.



Beaker X and beaker Y each contain 1.0 L of solution, as shown above. A student combines the solutions by pouring them into a larger, previously empty beaker Z and observes the formation of a white precipitate. Assuming that volumes are additive, which of the following sets of solutions could be represented by the diagram above?
Beaker X | Beaker Y| Beaker Z

(A) 2.0 *M* $AgNO_3$ | 2.0 *M* $MgCl_2$ | 4.0 *M* $Mg(NO_3)_2$ and AgCl(s)

(B) 2.0 *M* $AgNO_3$ | 2.0 *M* $MgCl_2$ | 2.0 *M* $Mg(NO_3)_2$ and AgCl(s)

(C) 2.0 *M* $AgNO_3$ | 1.0 *M* $MgCl_2$ | 1.0 *M* $Mg(NO_3)_2$ and AgCl(s)

(D) 2.0 *M* $AgNO_3$ | 1.0 *M* $MgCl_2$ | 0.50 *M* $Mg(NO_3)_2$ and AgCl(s) ✓

4. How many mL of 10.0 *M* HCl are needed to prepare 500. mL of 2.00 *M* HCl ?

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(A) 1.00 mL

(B) 10.0 mL

(C) 20.0 mL

(D) 100. mL ✓

(E) 200. mL

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5. If 200. mL of 0.60 *M* $MgCl_2(aq)$ is added to 400. mL of distilled water, what is the concentration of $Mg^{2+}(aq)$ in the resulting solution? (Assume volumes are additive).

(A) 0.20 *M* ✓

(B) 0.30 *M*

(C) 0.40 *M*

(D) 0.60 *M*

(E) 1.2 *M*

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6. How many moles of Na^+ ions are in 100. mL of 0.100 *M* Na_3PO_4 (aq) ?

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(A) **0.300 mol**

(B) **0.100 mol**

(C) **0.0300 mol** ✓

(D) **0.0100 mol**

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7. The volume of distilled water that should be added to 10.0 mL of 6.00 *M* HCl(*aq*) in order to prepare a 0.500 *M* HCl(*aq*) solution is approximately

(A) 50.0 mL

(B) 60.0 mL

(C) 100. ML

(D) 110. ML ✓

(E) 120. mL

The following questions refer to the below.

M^+ is an unknown metal cation with a +1 charge. A student dissolves the chloride of the unknown metal, MCl, in enough water to make 100.0 mL of solution. The student then mixes the solution with excess $AgNO_3$ solution, causing AgCl to precipitate. The student collects the precipitate by filtration, dries it, and records the data shown below. (The molar mass of AgCl is 143 g/mol.)

Mass of unknown chloride, MCl	0.74 g

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Mass of filter paper	0.80 g
Mass of filter paper plus AgCl precipitate	2.23 g

8. Which of the following diagrams best represents the $AgNO_3$ solution before the reaction occurs?
Note: water molecules are represented by the symbol

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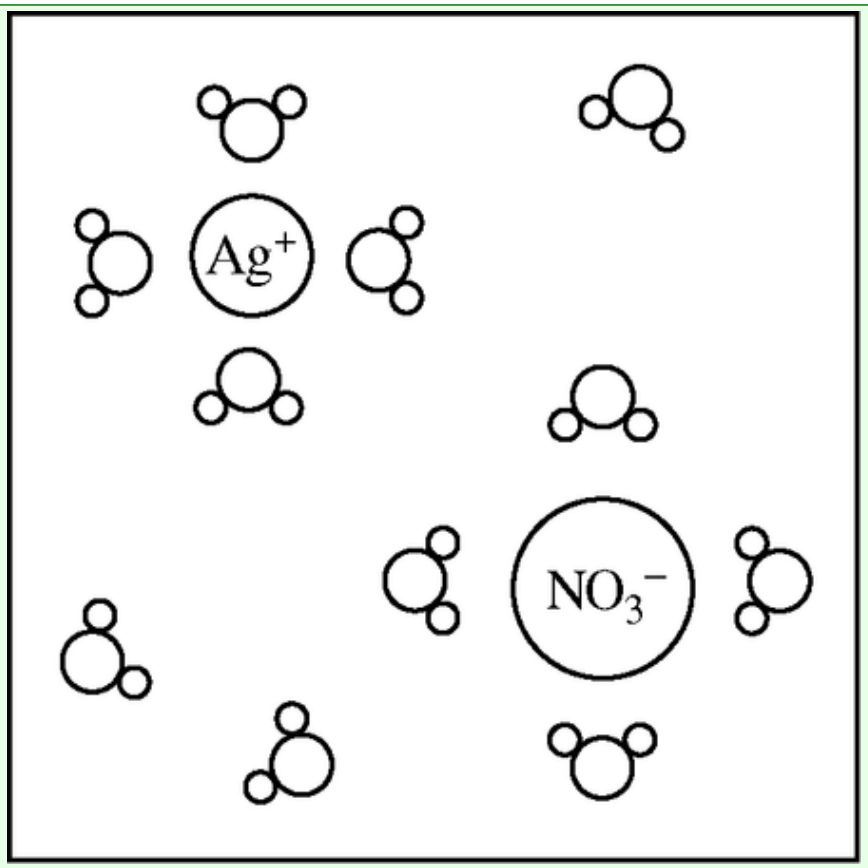
A



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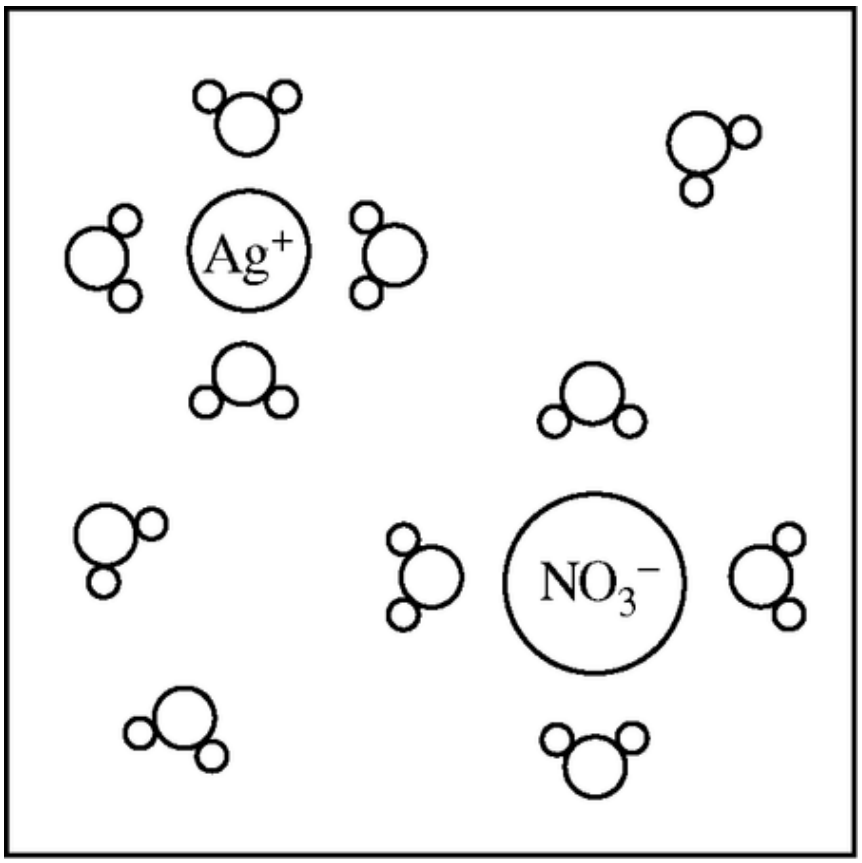
B



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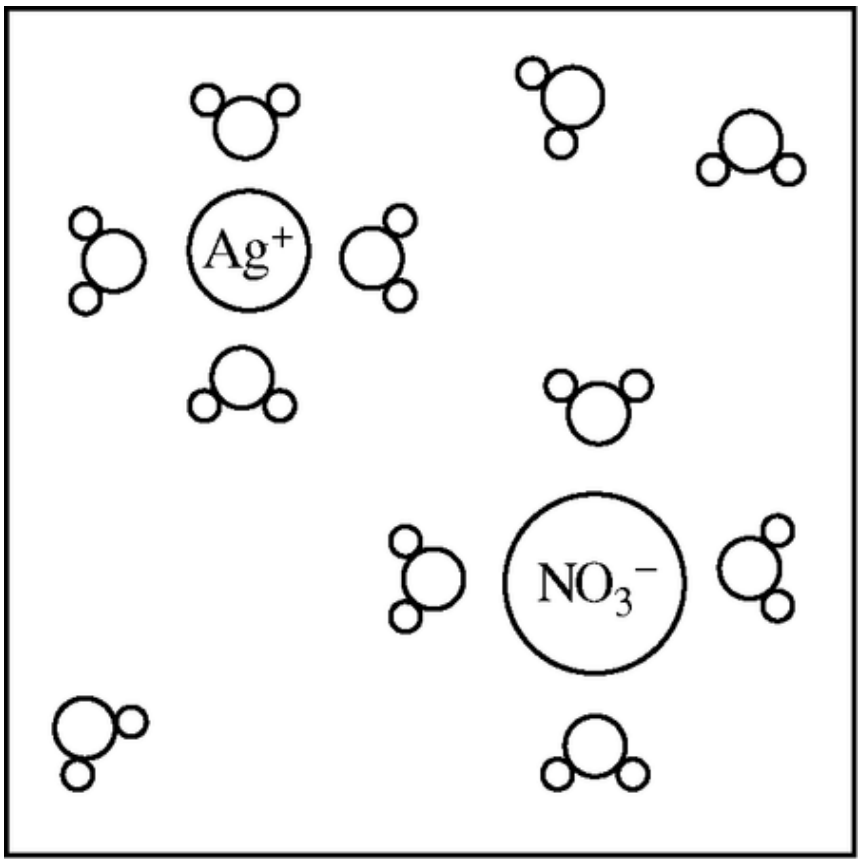
C



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