

ACID STRENGTH - INTRODUCTION TO COLLEGE CHEMISTRY FORMATIVE ASSESSMENT - KEY



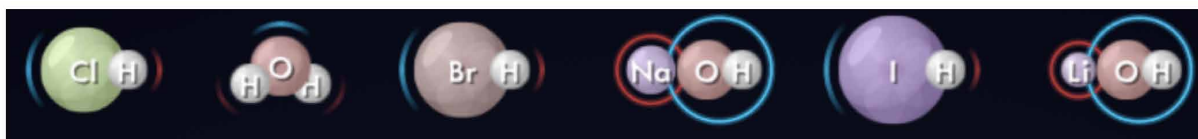
STUDENT CHECK FOR UNDERSTANDING

DIRECTIONS:

Identify the reactants and products from the bank that fulfill each scenario described in the table. Simply write the coefficients (if needed), chemical formulas, and state symbols (use "aq" for most, "ℓ" for H₂O, and "s" for solid when using Mg(OH)₂ as it is mostly insoluble in water) on the appropriate lines in the "Balanced Molecular Equation" column. Use the sandbox to help as needed. **Some substances may be used more than once and some scenarios might have more than one correct answer.**

Concepts:
Bronsted-Lowry Acids & Bases, Strong vs Weak Acids, Percent Dissociation, Neutralization Reactions, Polyprotic Acids, Amphoteric Substances, Conjugate Acids & Bases, and Charge of Resulting Ions

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Answers are examples. There may be more than one answer.

Scenario	Balanced Molecular Equation
A strong acid reacts with a base.	$\begin{array}{ccccccc} \underline{\hspace{1cm}} & \text{HCl (aq)} & + & \underline{\hspace{1cm}} & \text{NaOH (aq)} & \rightarrow & \underline{\hspace{1cm}} & \text{NaCl (aq)} & + & \underline{\hspace{1cm}} & \text{H}_2\text{O (ℓ)} \\ \text{Coefficient} & \text{Chemical} & & \text{Coefficient} & \text{Chemical} & & \text{Coefficient} & \text{Chemical} & & \text{Coefficient} & \text{Chemical} \\ \text{(If needed)} & \text{Formula} & + & \text{State} & & & \text{Formula} & + & \text{State} & & \text{Formula} & + & \text{State} \end{array}$
An acid that dissociates only partially at 0.1 M reacts with an ionic salt that fully dissociates at the same concentration.	$\text{HF (aq)} + \text{LiOH (aq)} \rightarrow \text{LiF (aq)} + \text{H}_2\text{O (ℓ)}$

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FORMATIVE ASSESSMENT - KEY

<p>Addition of this substance to water produces an amphoteric substance which can also dissociate in water. Write the equations for each individual reaction.</p>	$\text{H}_2\text{CO}_3 (\text{aq}) + \text{H}_2\text{O} (\ell) \rightleftharpoons \text{H}_3\text{O}^+ (\text{aq}) + \text{HCO}_3^- (\text{aq})$ $\text{HCO}_3^- (\text{aq}) + \text{H}_2\text{O} (\ell) \rightleftharpoons \text{H}_3\text{O}^+ (\text{aq}) + \text{CO}_3^{2-} (\text{aq})$
<p>The neutralization reaction between these two substances produces anions with -1 charges and cations with +2 charges.</p>	$2 \text{HNO}_3 (\text{aq}) + \text{Mg}(\text{OH})_2 (\text{s}) \rightarrow \text{Mg}(\text{NO}_3)_2 (\text{aq}) + 2 \text{H}_2\text{O} (\ell)$
<p>The neutralization reaction between these two substances involves a weak acid and produces anions with -1 charges and cations with +1 charges.</p>	$\text{HCN} (\text{aq}) + \text{KOH} (\text{aq}) \rightarrow \text{KCN} (\text{aq}) + \text{H}_2\text{O} (\ell)$
<p>A neutralization reaction occurs between a weak acid and a base that is not ionic.</p>	$\text{HF} (\text{aq}) + \text{NH}_3 (\text{aq}) \rightarrow \text{NH}_4\text{F} (\text{aq})$

Answers are examples. There may be more than one answer.