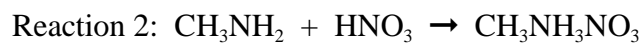
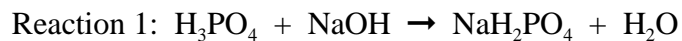


NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

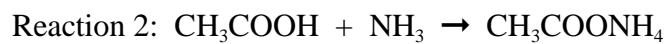
Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

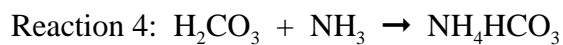
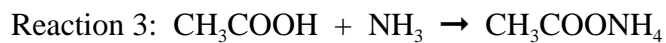
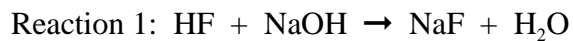
Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

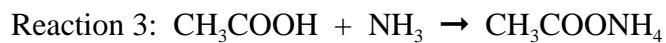
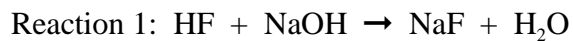
Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

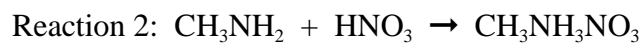
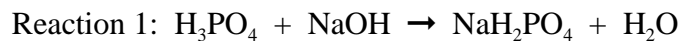
Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

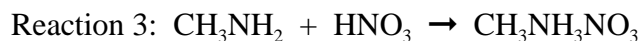
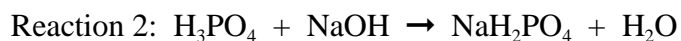
Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

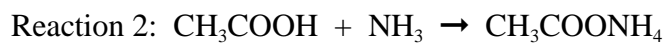
Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

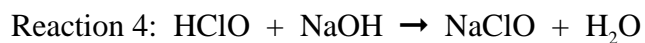
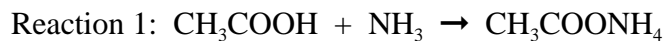
Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

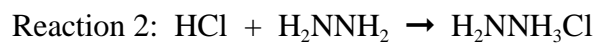
Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

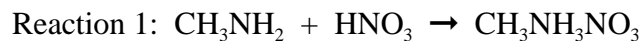
Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

NAME: \_\_\_\_\_

Write the Brønsted–Lowry reaction for each of the following Arrhenius reactions. ("H<sup>+</sup>" is an acceptable substitute for "H<sub>3</sub>O<sup>+</sup>". In either case, balance the reaction.)



Reaction 1: \_\_\_\_\_ →

Reaction 2: \_\_\_\_\_ →

Reaction 3: \_\_\_\_\_ →

Reaction 4: \_\_\_\_\_ →

Homework for test 4 – titration with a solid

- copy 111  $\text{H}_3\text{PO}_4 + \text{OH}^- \rightleftharpoons \text{H}_2\text{PO}_4^- + \text{H}_2\text{O}$   
 $\text{CH}_3\text{NH}_2 + \text{H}_3\text{O}^+ \rightleftharpoons \text{CH}_3\text{NH}_3^+ + \text{H}_2\text{O}$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$   
 $\text{Cl}^- + \text{H}_2\text{NNH}_2 \rightleftharpoons \text{H}_2\text{NNH}_3^+$
- copy 112  $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$   
 $\text{CH}_3\text{COOH} + \text{NH}_3 \rightleftharpoons \text{CH}_3\text{COO}^- + \text{NH}_4^+$  +  
 $\text{H}_2\text{CO}_3 + \text{NH}_3 \rightleftharpoons \text{NH}_4^+ + \text{HCO}_3^-$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$
- copy 113  $\text{HF} + \text{OH}^- \rightleftharpoons \text{F}^- + \text{H}_2\text{O}$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$   
 $\text{CH}_3\text{COOH} + \text{NH}_3 \rightleftharpoons \text{CH}_3\text{COO}^- + \text{NH}_4^+$  +  
 $\text{H}_2\text{CO}_3 + \text{NH}_3 \rightleftharpoons \text{NH}_4^+ + \text{HCO}_3^-$
- copy 114  $\text{HF} + \text{OH}^- \rightleftharpoons \text{F}^- + \text{H}_2\text{O}$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$   
 $\text{CH}_3\text{COOH} + \text{NH}_3 \rightleftharpoons \text{CH}_3\text{COO}^- + \text{NH}_4^+$  +  
 $\text{H}_2\text{CO}_3 + \text{NH}_3 \rightleftharpoons \text{NH}_4^+ + \text{HCO}_3^-$
- copy 115  $\text{H}_3\text{PO}_4 + \text{OH}^- \rightleftharpoons \text{H}_2\text{PO}_4^- + \text{H}_2\text{O}$   
 $\text{CH}_3\text{NH}_2 + \text{H}_3\text{O}^+ \rightleftharpoons \text{CH}_3\text{NH}_3^+ + \text{H}_2\text{O}$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$   
 $\text{Cl}^- + \text{H}_2\text{NNH}_2 \rightleftharpoons \text{H}_2\text{NNH}_3^+$
- copy 116  $\text{HClO} + \text{OH}^- \rightleftharpoons \text{ClO}^- + \text{H}_2\text{O}$   
 $\text{H}_3\text{PO}_4 + \text{OH}^- \rightleftharpoons \text{H}_2\text{PO}_4^- + \text{H}_2\text{O}$   
 $\text{CH}_3\text{NH}_2 + \text{H}_3\text{O}^+ \rightleftharpoons \text{CH}_3\text{NH}_3^+ + \text{H}_2\text{O}$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$
- copy 117  $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$   
 $\text{CH}_3\text{COOH} + \text{NH}_3 \rightleftharpoons \text{CH}_3\text{COO}^- + \text{NH}_4^+$  +  
 $\text{H}_2\text{CO}_3 + \text{NH}_3 \rightleftharpoons \text{NH}_4^+ + \text{HCO}_3^-$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$
- copy 118  $\text{CH}_3\text{COOH} + \text{NH}_3 \rightleftharpoons \text{CH}_3\text{COO}^- + \text{NH}_4^+$  +  
 $\text{H}_2\text{CO}_3 + \text{NH}_3 \rightleftharpoons \text{NH}_4^+ + \text{HCO}_3^-$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$   
 $\text{HClO} + \text{OH}^- \rightleftharpoons \text{ClO}^- + \text{H}_2\text{O}$
- copy 119  $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$   
 $\text{Cl}^- + \text{H}_2\text{NNH}_2 \rightleftharpoons \text{H}_2\text{NNH}_3^+$   
 $\text{HF} + \text{OH}^- \rightleftharpoons \text{F}^- + \text{H}_2\text{O}$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$
- copy 120  $\text{CH}_3\text{NH}_2 + \text{H}_3\text{O}^+ \rightleftharpoons \text{CH}_3\text{NH}_3^+ + \text{H}_2\text{O}$   
 $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$   
 $\text{Cl}^- + \text{H}_2\text{NNH}_2 \rightleftharpoons \text{H}_2\text{NNH}_3^+$   
 $\text{HF} + \text{OH}^- \rightleftharpoons \text{F}^- + \text{H}_2\text{O}$