

# Polyatomic Ions

Name PN

Period \_\_\_\_\_

Date \_\_\_\_\_

Instructions: complete this table by writing each formula and naming each compound!

|                               | Carbonate $\text{CO}_3^{-2}$ | Phosphate $\text{PO}_4^{-3}$ | Hydroxide $\text{OH}^-$  | Sulfate $\text{SO}_4^{-2}$   | Nitrate $\text{NO}_3^{-1}$ | Acetate $\text{C}_2\text{H}_3\text{O}_2^-$    |
|-------------------------------|------------------------------|------------------------------|--------------------------|------------------------------|----------------------------|-----------------------------------------------|
| Ammonium $\text{NH}_4^{+1}$   | $(\text{NH}_4)_2\text{CO}_3$ | $(\text{NH}_4)_3\text{PO}_4$ | $\text{NH}_4\text{OH}$   | $(\text{NH}_4)_2\text{SO}_4$ | $\text{NH}_4\text{NO}_3$   | $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$   |
| Barium $\text{Ba}^{+2}$       | $\text{BaCO}_3$              | $\text{Ba}_3(\text{PO}_4)_2$ | $\text{Ba}(\text{OH})_2$ | $\text{BaSO}_4$              | $\text{Ba}(\text{NO}_3)_2$ | $\text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2$ |
| Lithium $\text{Li}^{+1}$      | $\text{Li}_2\text{CO}_3$     | $\text{Li}_3\text{PO}_4$     | $\text{LiOH}$            | $\text{Li}_2\text{SO}_4$     | $\text{LiNO}_3$            | $\text{LiC}_2\text{H}_3\text{O}_2$            |
| Aluminum $\text{Al}^{+3}$     | $\text{Al}_2(\text{CO}_3)_3$ | $\text{AlPO}_4$              | $\text{Al}(\text{OH})_3$ | $\text{Al}_2(\text{SO}_4)_3$ | $\text{Al}(\text{NO}_3)_3$ | $\text{Al}(\text{C}_2\text{H}_3\text{O}_2)_3$ |
| Iron (II) $\text{Fe}^{+2}$    | $\text{FeCO}_3$              | $\text{Fe}_3(\text{PO}_4)_2$ | $\text{Fe}(\text{OH})_2$ | $\text{FeSO}_4$              | $\text{Fe}(\text{NO}_3)_2$ | $\text{Fe}(\text{C}_2\text{H}_3\text{O}_2)_2$ |
| Cobalt (III) $\text{Co}^{+3}$ | $\text{Co}_2(\text{CO}_3)_3$ | $\text{Co}_3(\text{PO}_4)_2$ | $\text{Co}(\text{OH})_3$ | $\text{Co}_2(\text{SO}_4)_3$ | $\text{Co}(\text{NO}_3)_3$ | $\text{Co}(\text{C}_2\text{H}_3\text{O}_2)_3$ |
| Copper (I) $\text{Cu}^{+1}$   | $\text{Cu}_2\text{CO}_3$     | $\text{Cu}_3\text{PO}_4$     | $\text{CuOH}$            | $\text{Cu}_2\text{SO}_4$     | $\text{CuNO}_3$            | $\text{CuC}_2\text{H}_3\text{O}_2$            |
| Lead (IV) $\text{Pb}^{+4}$    | $\text{Pb}(\text{CO}_3)_2$   | $\text{Pb}_3(\text{SO}_4)_4$ | $\text{Pb}(\text{OH})_4$ | $\text{Pb}(\text{SO}_4)_2$   | $\text{Pb}(\text{NO}_3)_4$ | $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_4$ |

1. Write the formula for each of the following compounds that contain polyatomic ions. Be sure to enclose the polyatomic ion in parentheses if more than one such ion is needed.

| Name               | Formula                      | Name                 | Formula                                       |
|--------------------|------------------------------|----------------------|-----------------------------------------------|
| Calcium phosphate  | $\text{Ca}_3\text{PO}_4$     | Iron (III) acetate   | $\text{Fe}(\text{C}_2\text{H}_3\text{O}_2)_3$ |
| Ammonium nitrate   | $\text{NH}_4\text{NO}_3$     | Barium sulfate       | $\text{BaSO}_4$                               |
| Aluminum carbonate | $\text{Al}_2(\text{CO}_3)_3$ | Copper (I) hydroxide | $\text{CuOH}$                                 |

2. Name each of the following compounds, which contain polyatomic ions.

| Formula                      | Name                    | Formula                                       | Name                 |
|------------------------------|-------------------------|-----------------------------------------------|----------------------|
| $\text{Fe}(\text{NO}_3)_3$   | Iron(III) nitrate       | $\text{Al}_2(\text{SO}_4)_3$                  | Aluminum sulfate     |
| $\text{Co}_3(\text{PO}_4)_2$ | Cobalt(II) phosphate    | $\text{Cr}(\text{C}_2\text{H}_3\text{O}_2)_2$ | Chromium(II) acetate |
| $\text{Cr}(\text{OH})_3$     | Chromium(III) hydroxide | $(\text{NH}_4)_2\text{SO}_4$                  | ammonium sulfate     |