

## Solubility Rules Worksheet

As you work through the steps in the lab procedures, record your experimental values and the results on this worksheet.

**Table A:** Investigating Trends in Solubility

	$\text{NH}_4^{1+}$	$\text{K}^{1+}$	$\text{Ca}^{2+}$	$\text{Sr}^{2+}$	$\text{Mg}^{2+}$	$\text{Al}^{3+}$	$\text{Fe}^{3+}$	$\text{Zn}^{2+}$
$\text{Cl}^{1-}$								
$\text{ClO}_4^{1-}$								
$\text{OH}^{1-}$								
$\text{CO}_3^{2-}$								
$\text{SO}_4^{2-}$								
$\text{PO}_4^{3-}$								

Additional Observations:

**Question 1:** In general, are compounds containing ammonium ions or ions from Group 1 on the Periodic Table soluble or insoluble?

**Question 2:** What exceptions did you find to the Group 1 rule?

**Question 3:** Are compounds containing an ion with either a +1 or a -1 charge soluble or insoluble?

**Question 4:** What exceptions did you find to the charge rule?

**Question 5:** In general, are compounds containing the carbonate anion soluble or insoluble?

**Question 6:** What exceptions did you find to the carbonate ion rule?

**Question 7:** In general, are compounds containing the sulfate anion soluble or insoluble?

**Question 8:** What exceptions did you find to the sulfate ion rule?

**Question 9:** In general, are compounds containing the phosphate anion soluble or insoluble?

**Question 10:** What exceptions did you find to the phosphate ion rule?

**Question 11:** Considering the general rules you found for Group 1 ions and phosphate ion, which rule takes precedence?

**Question 12:** State a general rule that relates the solubility of an ionic compound with the charges on the ions of which it is composed.

**Question 13:** In your Data Table A, write the chemical formula for any compound that precipitated. Pay attention to charges on the ions; the number of positive charges in the formula should equal the number of negative charges.

**Question 14:** Write balanced net ionic equations for reactions that produced a precipitate containing magnesium ion, ( $\text{Mg}^{2+}$ ).

**Table B:** Investigating Some Exceptions to the Solubility Rules

	$\text{Ag}^{1+}$	$\text{Pb}^{2+}$
$\text{Cl}^{1-}$		

Additional Observations:

**Question 15:** What exceptions did you observe by mixing  $\text{Ag}^{1+}$  with  $\text{Cl}^{-}$  and  $\text{Pb}^{2+}$  with  $\text{Cl}^{-}$ ?

**Question 16:** In your Data Table B, write the chemical formula for any compound that precipitated. Pay attention to charges on the ions; the number of positive charges in the formula should equal the number of negative charges.

**Question 17:** Write balanced net ionic equations for reactions that produced a precipitate in Data Table B.