

1. Which ions are present in the following unknown solutions:

	Unknown solution	Test solution	Results	Ions present
A	$\text{Ag}^+$ or $\text{Mg}^{2+}$	HCl	Ppt	
B	$\text{Cr}^{3+}$ or $\text{K}^+$	$(\text{NH}_4)_2\text{CO}_3$	No ppt	
C	$\text{Fe}^{2+}$ or $\text{Sr}^{2+}$	$\text{NH}_4\text{OH}$	Ppt	
D	$\text{Pb}^{2+}$ or $\text{Mn}^{2+}$	HCl	No ppt	

2. A solution contains  $\text{Mg}^{2+}$ ,  $\text{Pb}^{2+}$  and  $\text{Zn}^{2+}$ . What compounds could be added, and in what order, to separate these ions?

3. A solution contains one or more of  $\text{Ag}^+$ ,  $\text{Ba}^{2+}$  and  $\text{Ni}^{2+}$ . What ions could be added, and in what order, to determine which of these cations are present?

Setup a table of solubilities:

4. A solution contains  $\text{Sr}^{2+}$ ,  $\text{Ca}^{2+}$  and  $\text{Ag}^+$ . What compounds could be added, and in what order, to separate these ions?

5. A solution contains  $\text{Fe}^{3+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Ag}^+$  and  $\text{Be}^{2+}$ . What compounds could be added, and in what order, to separate these ions?

6. A solution is known to contain one or more of the ions:  $\text{S}^{2-}$ ,  $\text{OH}^-$ ,  $\text{Cl}^-$  and  $\text{CO}_3^{2-}$ . You are to identify the ions present using ONLY the reagents:  $\text{AgNO}_3$ ,  $\text{Ba}(\text{NO}_3)_2$ ,  $\text{Cu}(\text{NO}_3)_2$  and  $\text{Sr}(\text{NO}_3)_2$ . Briefly describe a procedure which could be used in analyze the anions in the solution.