

## Solubility #2

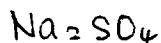
1. A solution contains  $\text{SO}_4^{2-}$  and  $\text{Cl}^-$ . Outline an experimental procedure to remove each ion individually from the solution, and identify the reagents used in the procedure.

① Add either  $\text{Ca}(\text{NO}_3)_2$  or  $\text{Sr}(\text{NO}_3)_2$   
or  $\text{Ba}(\text{NO}_3)_2$  allow it to settle  $\rightarrow$  ppt's  $\text{SO}_4^{2-}$

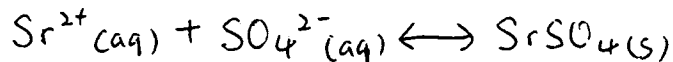
② Add  $\text{CuNO}_3$  to ppt  $\text{Cl}^-$ . Allow it to settle out

2. A solution is known to contain  $\text{Cu}^+$ ,  $\text{Be}^{2+}$  and  $\text{Sr}^{2+}$  ions, each at a concentration of 0.20 M.

(a) What compound could be used to precipitate the  $\text{Sr}^{2+}$  while leaving the other two cations in solution?



(b) Write the net ionic equation for the reaction.



3. A solution contains  $\text{Pb}^{2+}$ ,  $\text{Mg}^{2+}$ , and  $\text{Sr}^{2+}$ . Outline a procedure to isolate the precipitate  $\text{SrSO}_4$  from this solution.

\* 1) Use  $\text{NaCl}$  to ppt  $\text{Pb}^{2+}$  as  $\text{PbCl}_2$

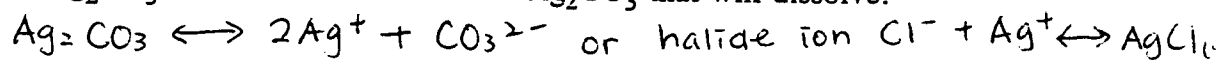
2) Use  $\text{Na}_2\text{SO}_4$  to ppt  $\text{SrSO}_4$

or

1) Use  $\text{KOH}$  to ppt both  $\text{Pb}^{2+}$  and  $\text{Mg}^{2+}$  as  $\text{Pb}(\text{OH})_2$  and  $\text{Mg}(\text{OH})_2$

2) Use  $\text{Na}_2\text{SO}_4$  to ppt  $\text{SrSO}_4$

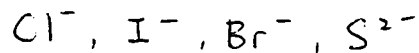
4. Write the formula of two materials (other than water) that could be added to a saturated solution of  $\text{Ag}_2\text{CO}_3$  to increase the amount of  $\text{Ag}_2\text{CO}_3$  that will dissolve.



add something to remove  $\text{Ag}^+$  or  $\text{CO}_3^{2-}$  eg. Acid  $\rightarrow \text{CO}_3^{2-} + 2\text{H}^+ \rightleftharpoons$

5. A solution contains  $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$  and  $\text{Pb}^{2+}$  ions that must be separated.

(a) Identify an anion that could be used to remove **only** the lead ion by precipitation.

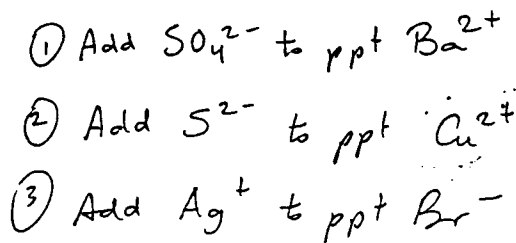


(b) Identify an anion that could be used to separate  $\text{Ca}^{2+}$  from  $\text{Sr}^{2+}$ .

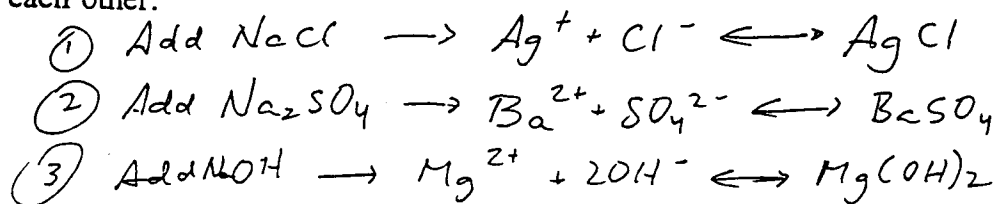


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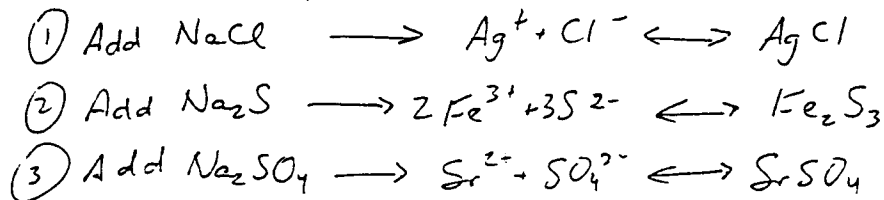
6. Use the table of solubilities to determine a scheme that allows the separation of  $\text{Ba}^{2+}$ ,  $\text{Cu}^{2+}$ , and  $\text{Br}^-$  from each other.



7. Use the table of solubilities to describe how you would separate  $\text{Mg}^{2+}$ ,  $\text{Ba}^{2+}$  and  $\text{Ag}^+$  from each other.



8. Use the table of solubilities to outline a scheme to separate a mixture of  $\text{Li}^+$ ,  $\text{Ag}^+$ ,  $\text{Sr}^{2+}$  and  $\text{Fe}^{3+}$  from each other.



$\text{Li}^+$  is left.

9. A beaker contains  $\text{OH}^-$  ions and  $\text{S}^{2-}$  ions in solution both at a concentration of 0.10 M. You are asked to precipitate the  $\text{OH}^-$  ions while leaving the  $\text{S}^{2-}$  ions in solution.

(a) Which reagent could you use?



(b) Write the net ionic equation for the precipitation reaction.

