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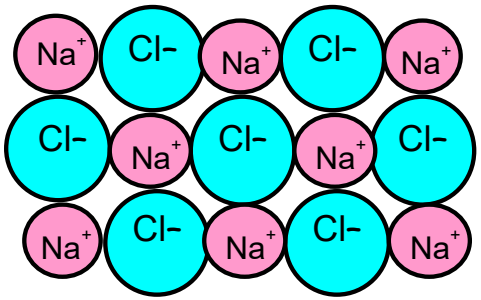
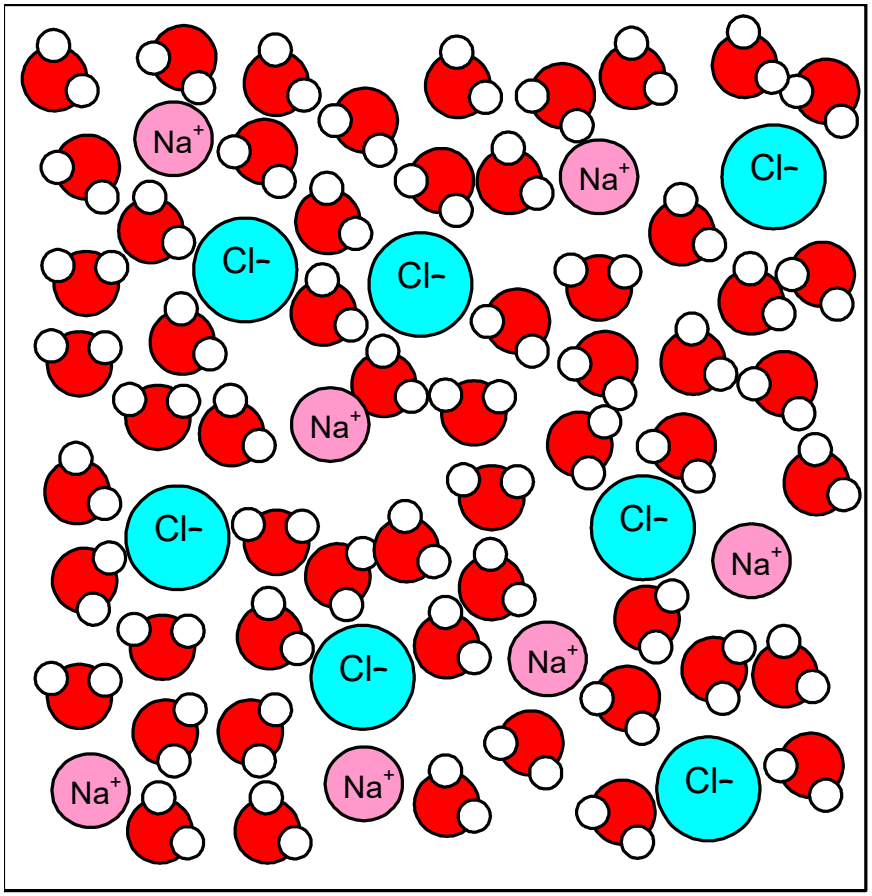
GROUP 2 – SULFATES & HYDROXIDES

When an IONIC substance dissolves, the ions separate and mix in with the water:

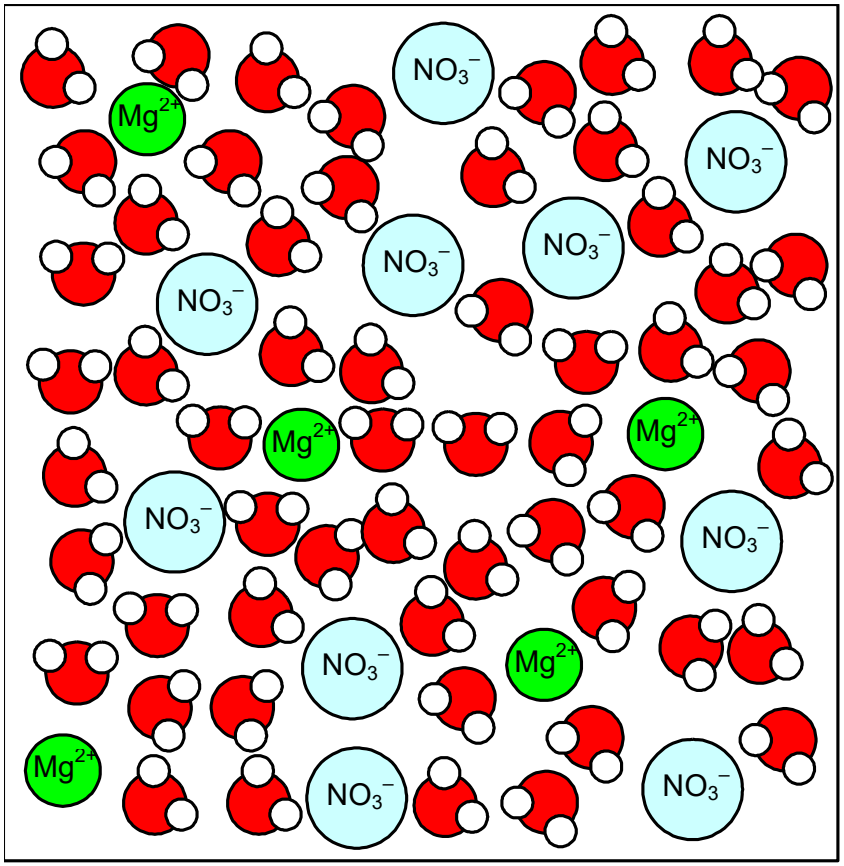


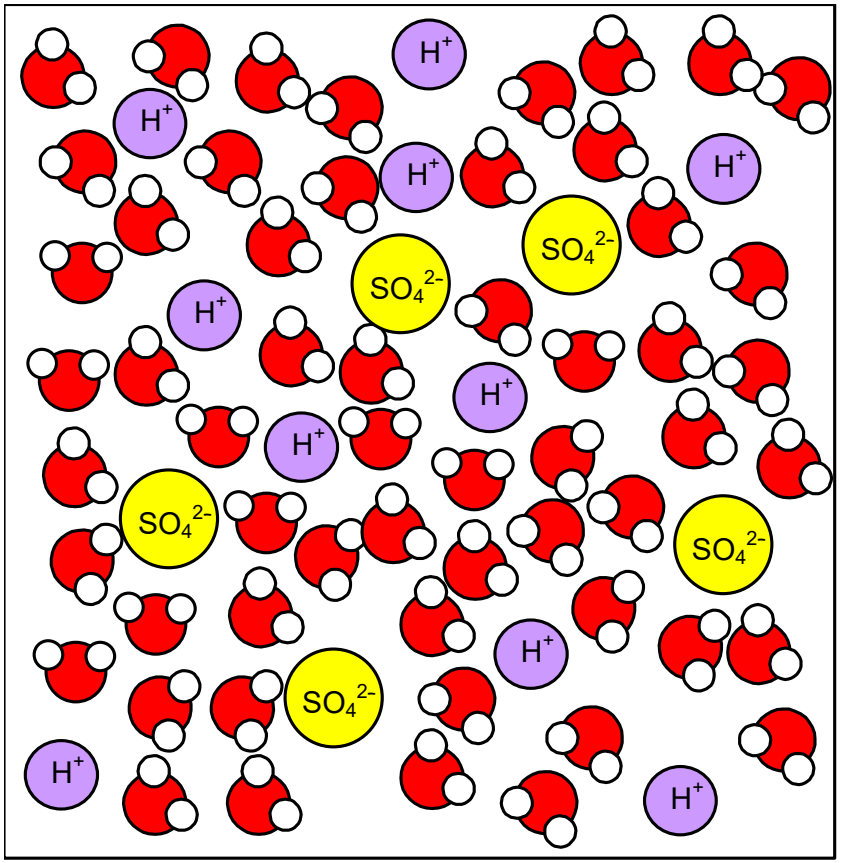
NaCl(s)



NaCl(aq)

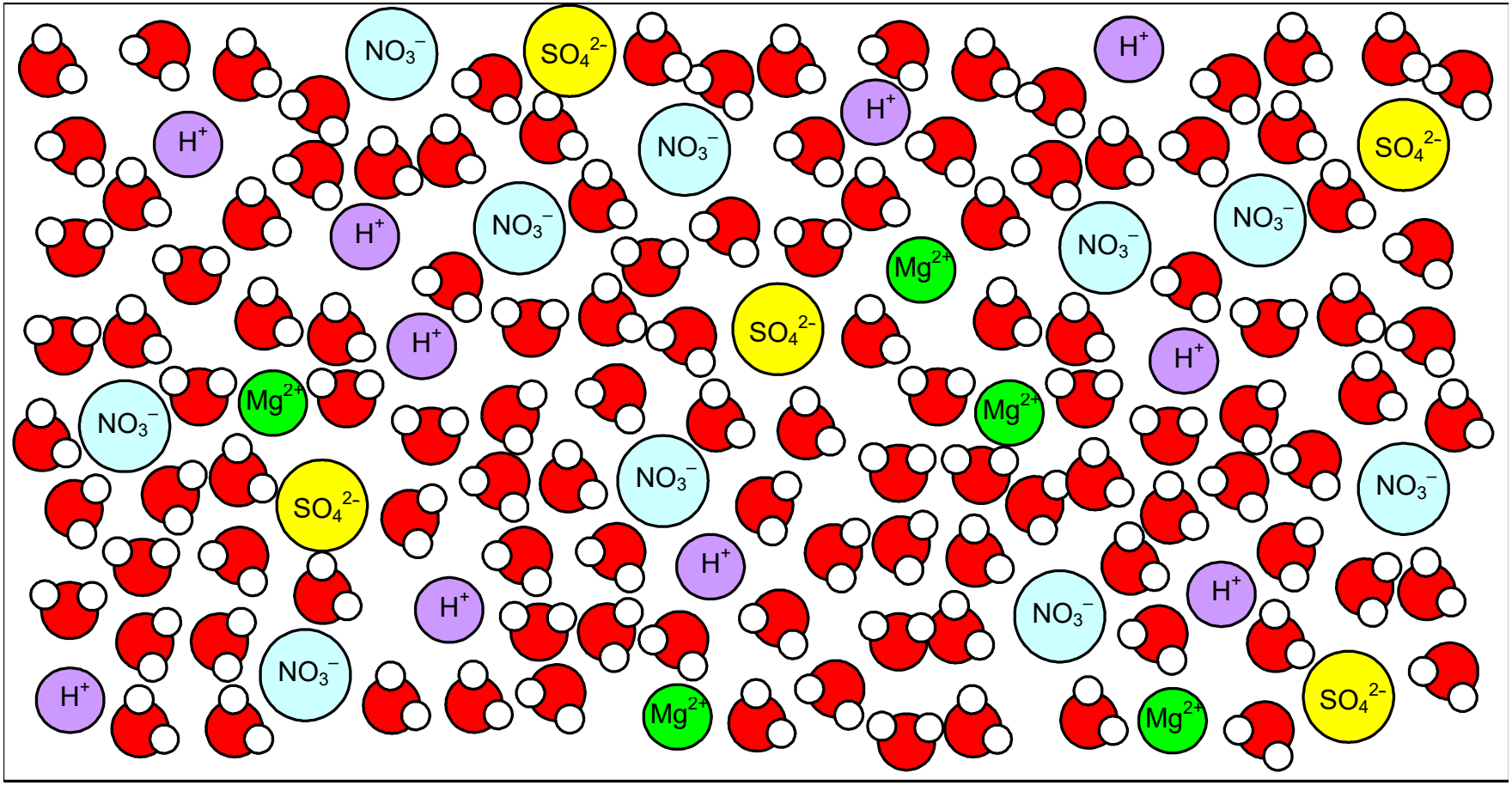
Mix solutions of two ionic compounds:





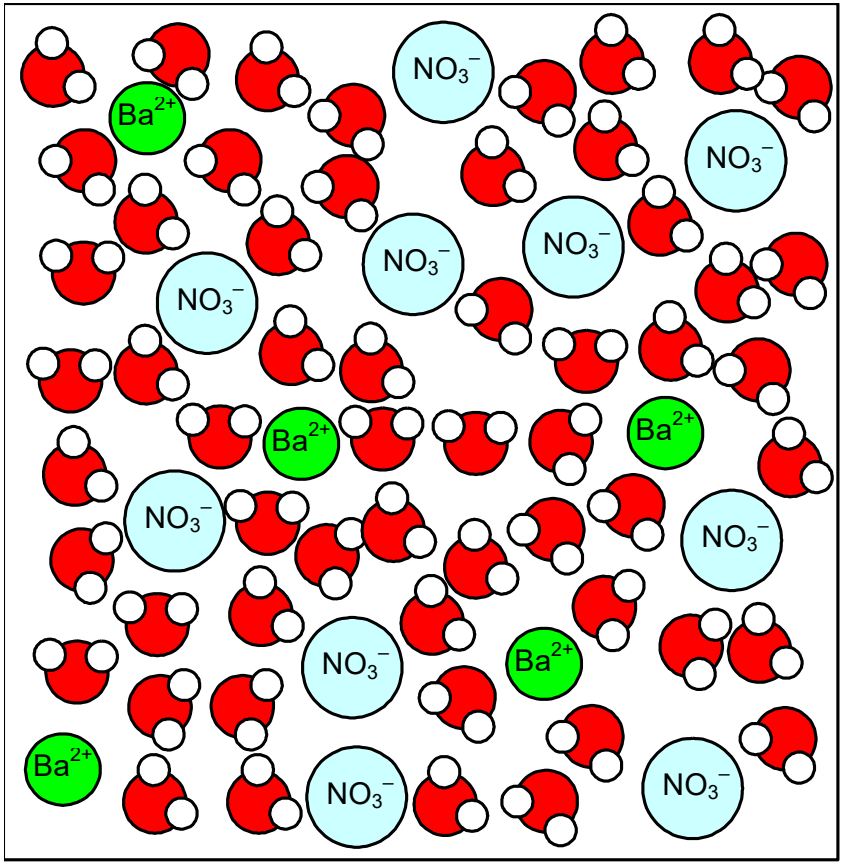
$Mg(NO_3)_2(aq)$ **$H_2SO_4(aq)$**

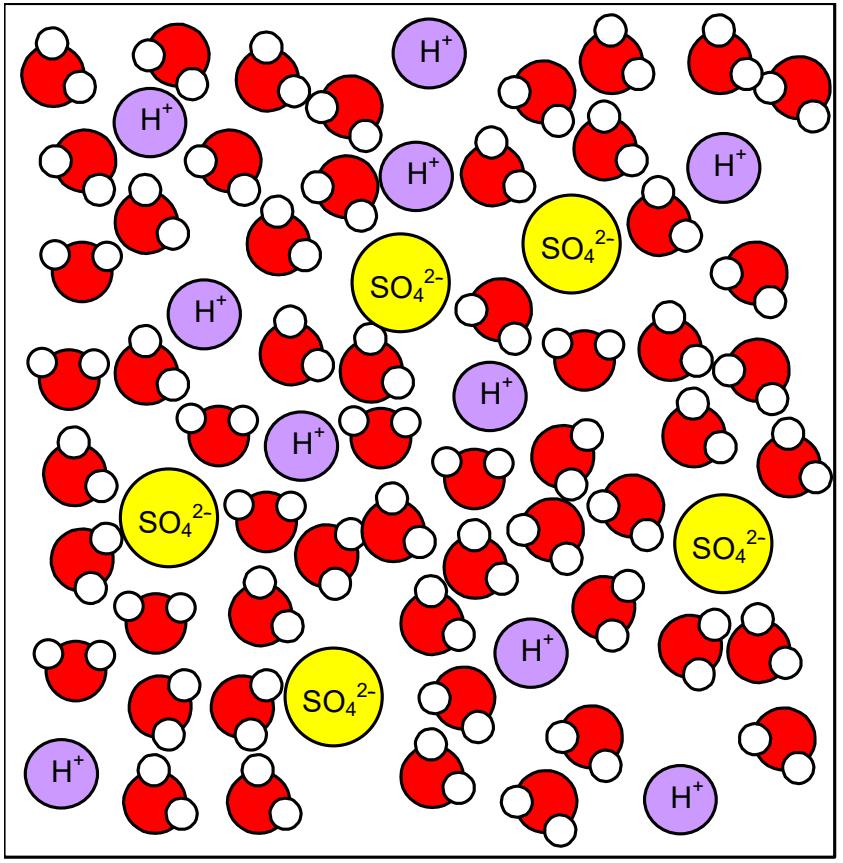
they may just mix!



No reaction

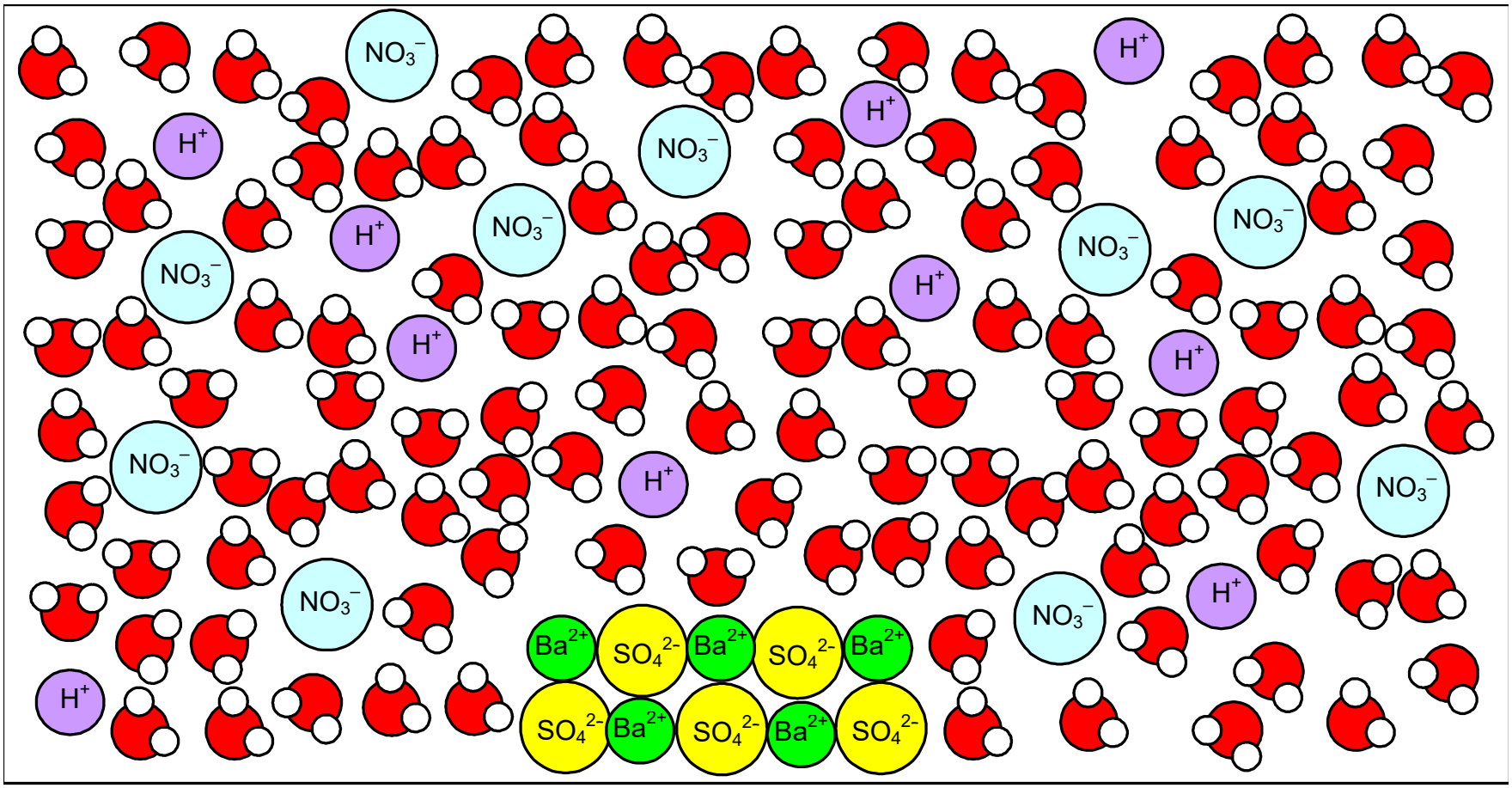
Mix solutions of two ionic compounds:



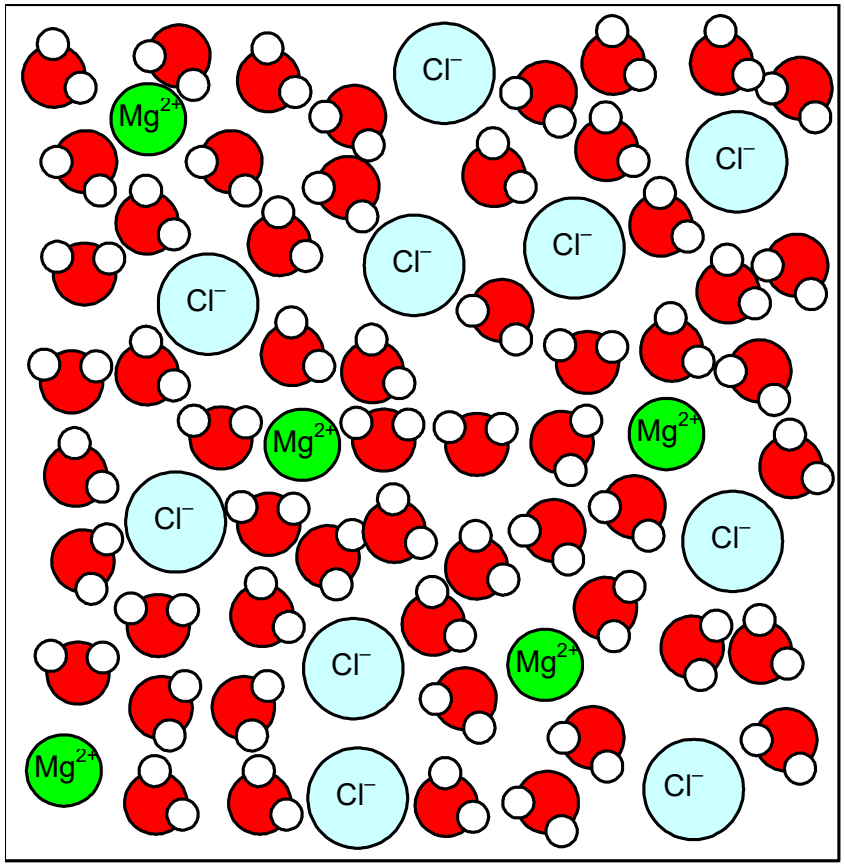


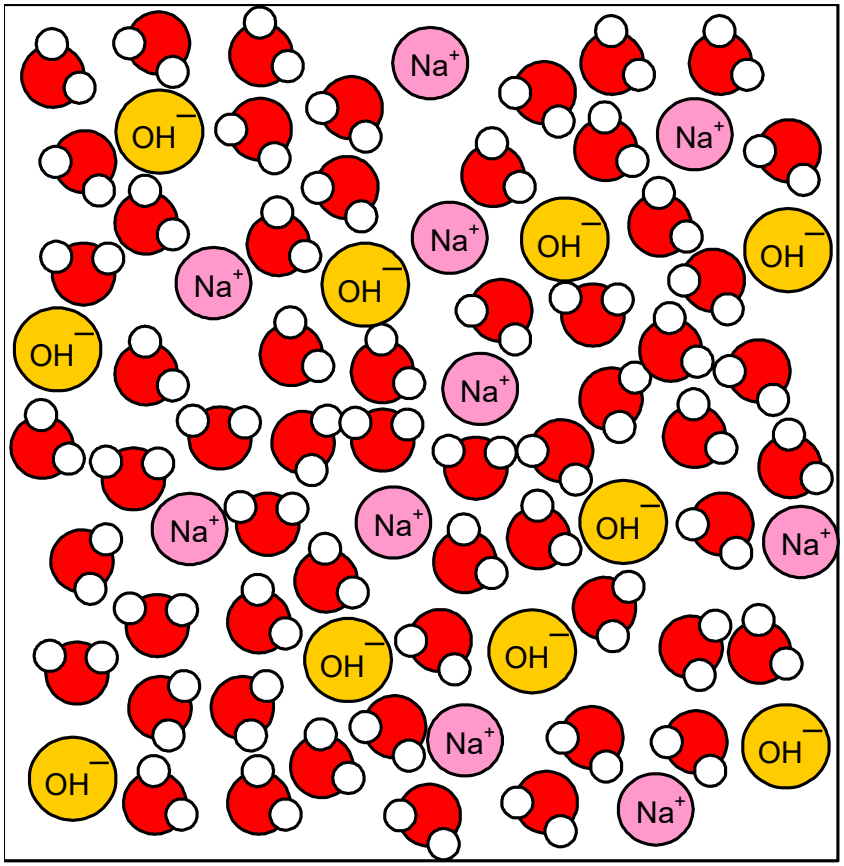
$Ba(NO_3)_2(aq)$ **$H_2SO_4(aq)$**

or a precipitate may form (if it gives a combination of ions that is insoluble)



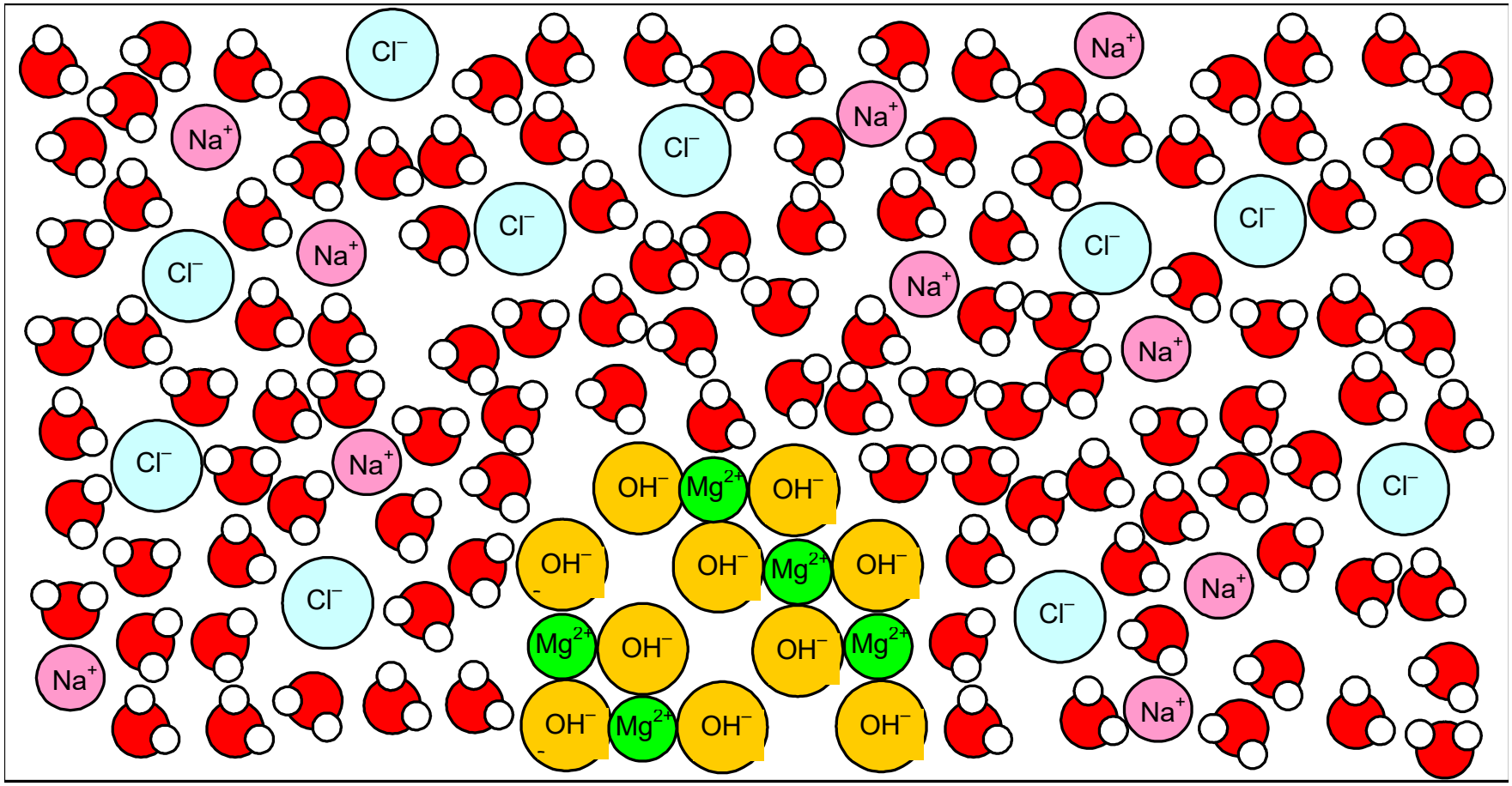
$$Ba^{2+}(aq) + SO_4^{2-}(aq) \rightarrow BaSO_4(s)$$



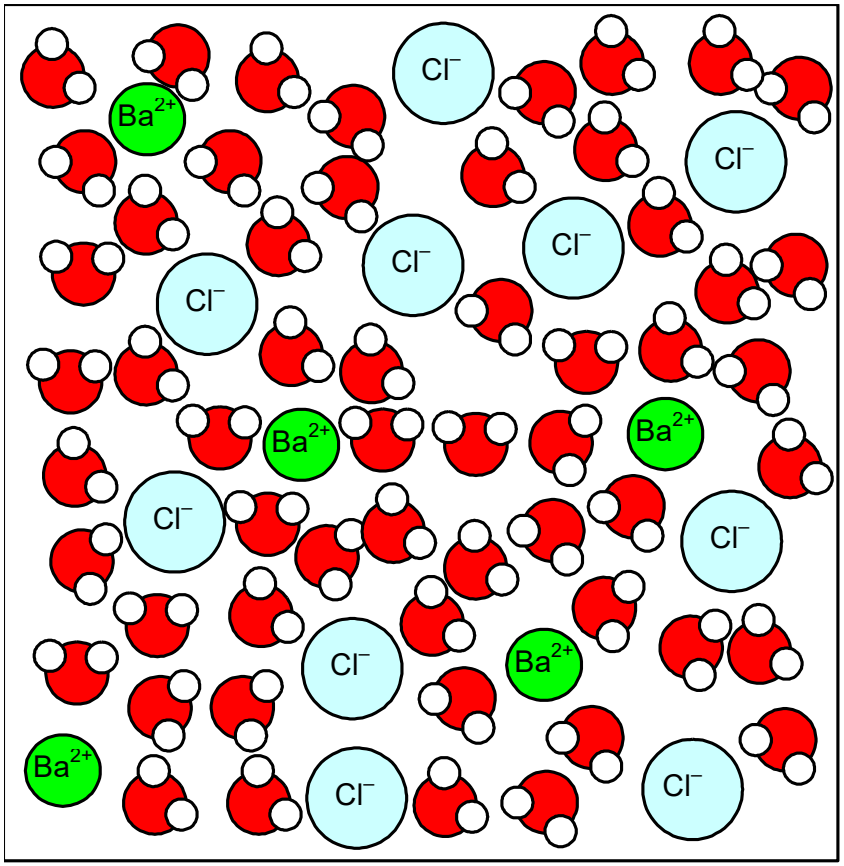


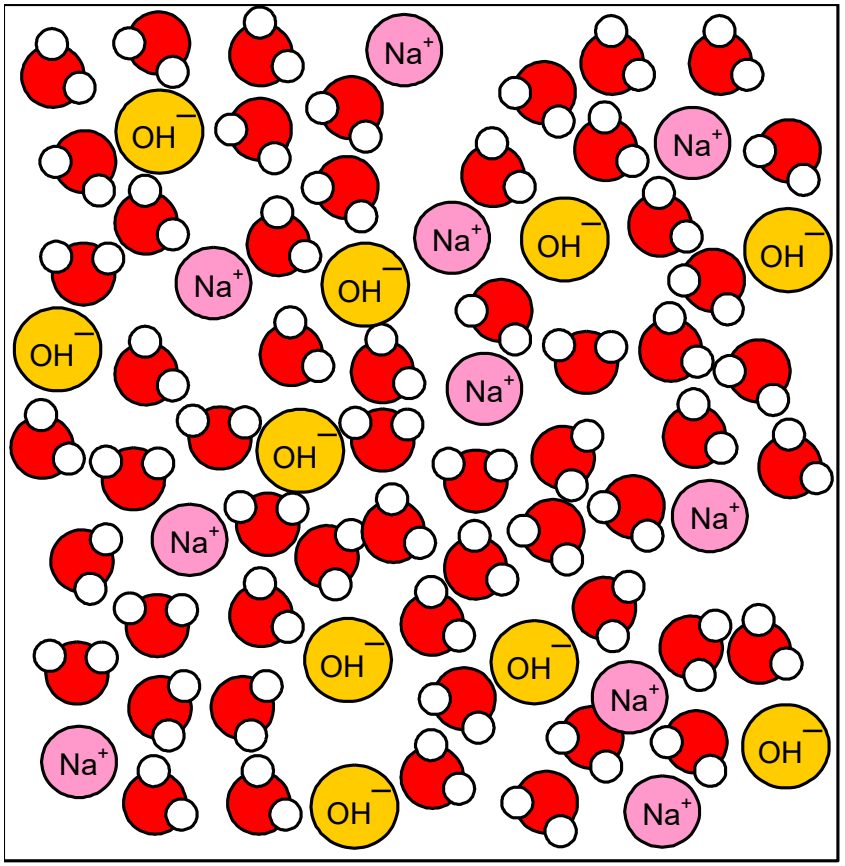
$MgCl_2(aq)$

$NaOH(aq)$

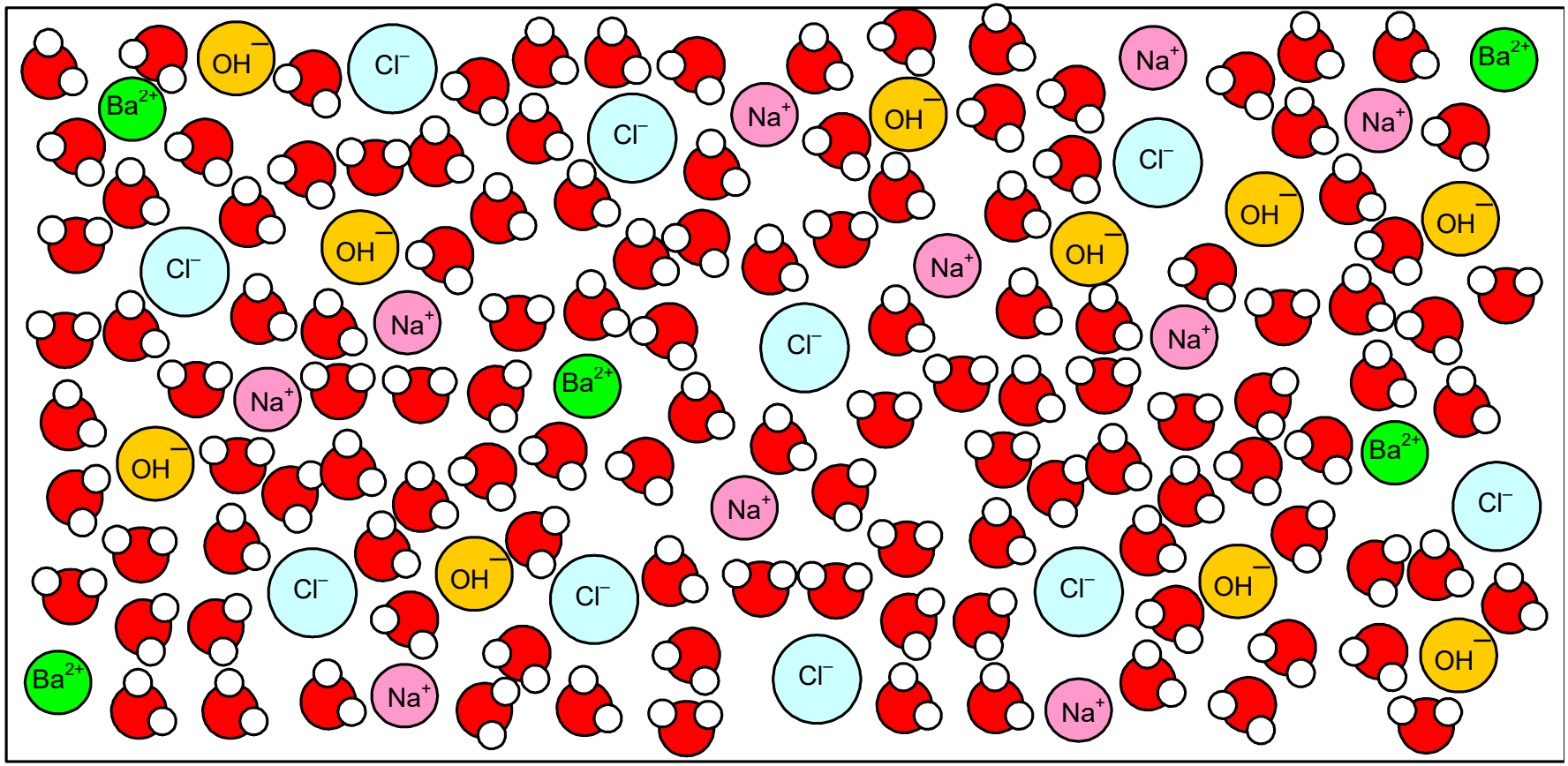


$$Mg^{2+}(aq) + 2\,OH^{-}(aq) \rightarrow Mg(OH)_2\,(s)$$





$BaCl_2(aq)$ **$NaOH(aq)$**



No reaction

Group 2 sulphates

$MgSO_4$		
$CaSO_4$		
$SrSO_4$		
$BaSO_4$		

Group 2 sulphates

$MgSO_4$	Soluble	
$CaSO_4$	Slightly soluble	
$SrSO_4$	Insoluble	
$BaSO_4$	Insoluble	

Group 2 sulphates

$MgSO_4$	Soluble	
$CaSO_4$	Slightly soluble	$Ca^{2+}(aq) + SO_4^{2-}(aq) \rightarrow CaSO_4(s)$
$SrSO_4$	Insoluble	$Sr^{2+}(aq) + SO_4^{2-}(aq) \rightarrow SrSO_4(s)$
$BaSO_4$	Insoluble	$Ba^{2+}(aq) + SO_4^{2-}(aq) \rightarrow BaSO_4(s)$

Group 2 hydroxides

$Mg(OH)_2$		
$Ca(OH)_2$		
$Sr(OH)_2$		
$Ba(OH)_2$		

Group 2 hydroxides

$Mg(OH)_2$	Insoluble	
$Ca(OH)_2$	Slightly soluble	
$Sr(OH)_2$	Soluble	
$Ba(OH)_2$	Souble	

Group 2 hydroxides

$Mg(OH)_2$	Insoluble	$Mg^{2+}(aq) + 2\ OH^-(aq) \rightarrow Mg(OH)_2(s)$
$Ca(OH)_2$	Slightly soluble	$Ca^{2+}(aq) + 2\ OH^-(aq) \rightarrow Ca(OH)_2(s)$
$Sr(OH)_2$	Soluble	
$Ba(OH)_2$	Souble	

more soluble

✓	$MgSO_4$	$Mg(OH)_2$	✗
✓✗	$CaSO_4$	$Ca(OH)_2$	✓✗
✗	$SrSO_4$	$Sr(OH)_2$	✓
✗	$BaSO_4$	$Ba(OH)_2$	✓

more soluble

Remember

- Opposite trends
- $Ca(OH)_2$ & $CaSO_4$ sparingly soluble
- $BaSO_4$ insoluble

Barium meal

$BaSO_4$

Milk of magnesia

$Mg(OH)_2$

Slaked lime $Ca(OH)_2$