Noteset 6D – Hydrates and Molar Ratios
In Class Notes

Standard Ionic

$$Na^\circ \quad \overset{e^-}{\cdot}\ddot{\underset{\cdot\cdot}{Cl}}\cdot$$

$$Na^{1+} - Cl^{1-}$$

$$\underset{\text{dissolves}}{\overset{\text{In } H_2O}{\longrightarrow}} Na^{1+} + Cl^{1-}$$
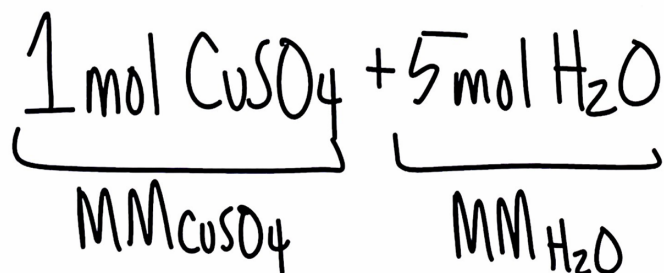
Hydrate

$$CaSO_4 \overset{\text{water}}{\longrightarrow} CaSO_4$$
(does not dissolve)

$$Ca^{+2} \quad SO_4^{-2}$$

$$CuSO_4 \cdot \underline{\underline{5}} H_2O$$

$(1 CuSO_4 : 5 H_2O)$

$[1 : 5]$
Molar Ratio

$\underbrace{1 \text{ mol } CuSO_4}_{MM_{CuSO_4}} + \underbrace{5 \text{ mol } H_2O}_{MM_{H_2O}}$

$$ZnSO_4 \cdot \underline{\underline{7}} H_2O$$

$(1 ZnSO_4 : 7 H_2O)$

$[\underline{1} : 7]$
Molar Ratio

$\underbrace{1 \text{ mol } ZnSO_4}_{MM_{ZnSO_4}} + \underbrace{7 \text{ mol } H_2O}_{MM_{H_2O}}$
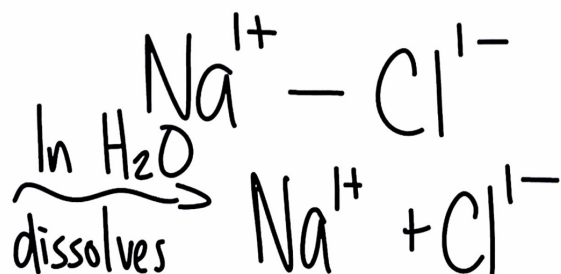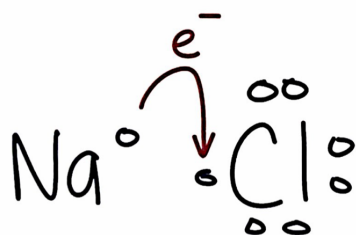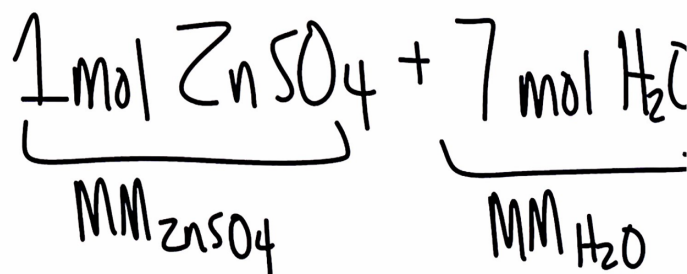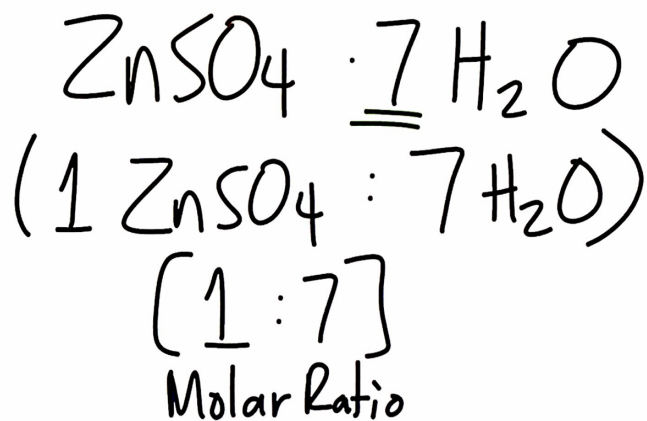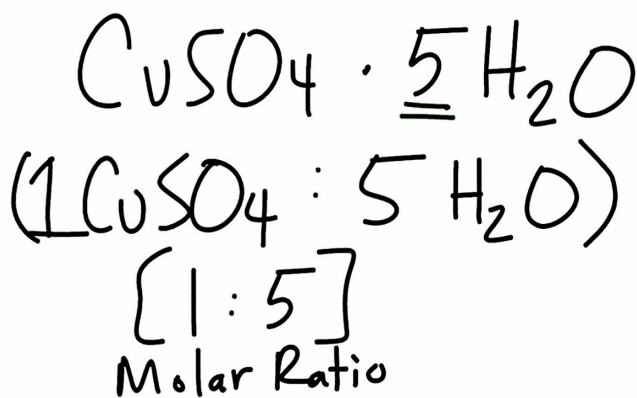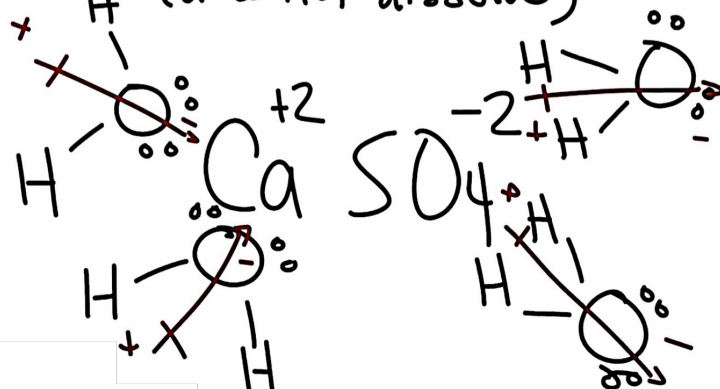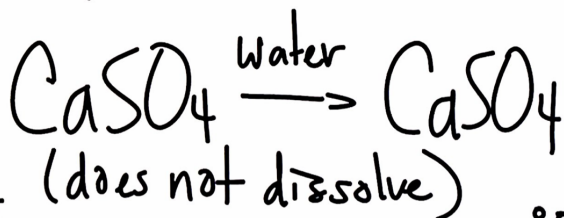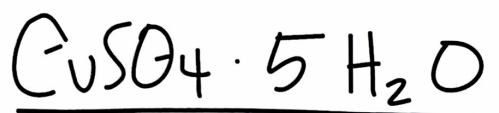
$CuSO_4 \cdot 5H_2O$

$Cu: 1 \cdot 63.55g$ $H: 2 \cdot 1.01g$

$S: 1 \cdot 32.07g$ $O: 1 \cdot 16.00g$

$O: 4 \cdot 16.00g$

$\underline{\hspace{3cm}} \quad 18.02g$

$159.62g$

$CuSO_4 \cdot 5H_2O = 159.62g + 5(18.02g)$

$\qquad\qquad = 249.72 \, g/mol$

$Zn(NO_3)_2 \cdot 6H_2O$

$Zn: 1 \cdot 65.39g$ $H: 2 \cdot 1.01g$

$N: 2 \cdot 14.01g$ $O: 1 \cdot 16.00g$

$O: 6 \cdot 16.00g$

$\underline{\hspace{3cm}} \quad H_2O: 18.02g$

$Zn(NO_3)_2 = 189.41g$

$Zn(NO_3)_2 \cdot 6H_2O$
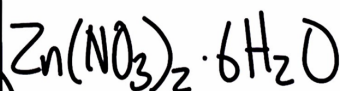
$\quad = 189.41g + 6 \cdot 18.02g = 297.53 \frac{g}{mol}$