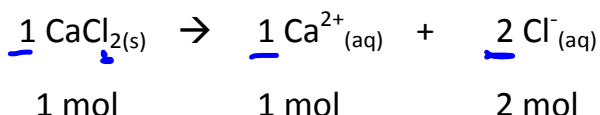


## Concentrations of ions in solution

- When an ionic compound is in solution, it dissociates into its ions.
- In many industries it is important to know the concentration of the individual **ions**, not the **compound**
- To do this we use the dissociation/ionization equations

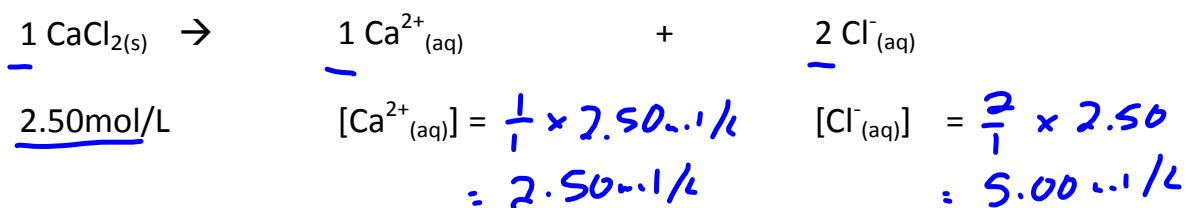


- Ion concentration is always equal to a whole number multiple of the compound concentration.



- 1 mole of  $\text{CaCl}_{2(s)}$  will produce 1 mole of  $\text{Ca}^{2+}_{(aq)}$  and 2 moles of  $\text{Cl}^-_{(aq)}$ . Because the volume doesn't change we can use that ratio to determine the concentration of the ions

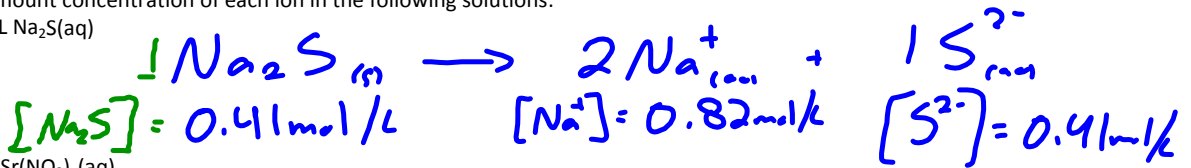
### Example:



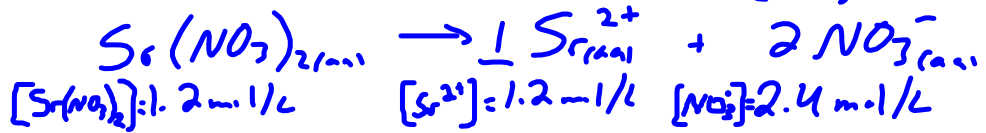
Practice Sheet 5

1. Find the amount concentration of each ion in the following solutions:

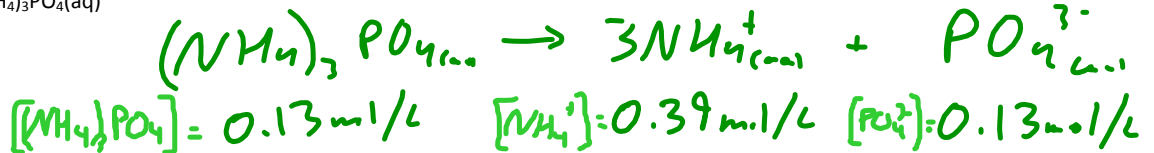
(a) 0.41 mol/L  $\text{Na}_2\text{S}(\text{aq})$



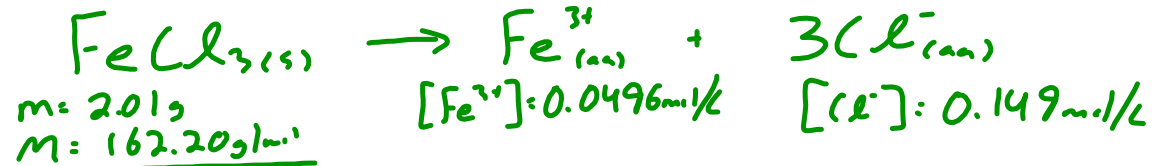
(a) 1.2 mol/L  $\text{Sr}(\text{NO}_3)_2(\text{aq})$



(b) 0.13 mol/L  $(\text{NH}_4)_3\text{PO}_4(\text{aq})$



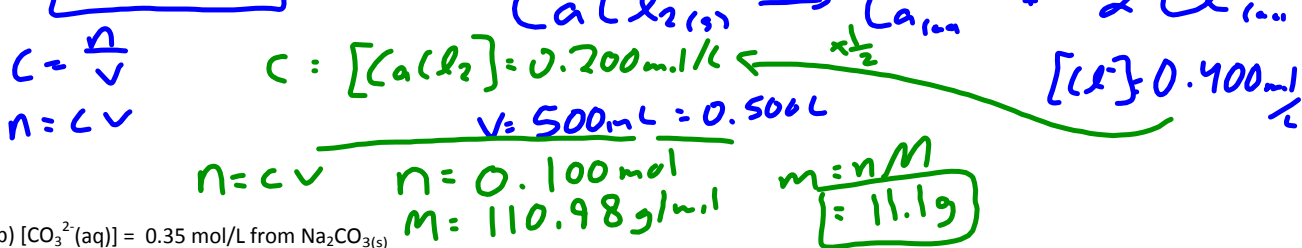
2. A 250 mL solution is prepared by dissolving 2.01 g of iron(III) chloride in water. What is the amount concentration of each ion in the solution?



$$c = 0.0496 \text{ mol/L} \quad n = 0.023 \text{ mol} \quad v = 0.250 \text{ L}$$

3. In order to prepare for a chemical analysis, a lab technician requires 500 mL of each of the following solutions. Calculate the mass of solid required for each solution:

(a)  $[\text{Cl}^- (\text{aq})] = 0.400 \text{ mol/L}$  from  $\text{CaCl}_2(\text{s})$



(b)  $[\text{CO}_3^{2-} (\text{aq})] = 0.35 \text{ mol/L}$  from  $\text{Na}_2\text{CO}_3(\text{s})$

