

# Homework Check.

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## Chemistry 20 In Class Assignment

Key

### What is Dissociation?

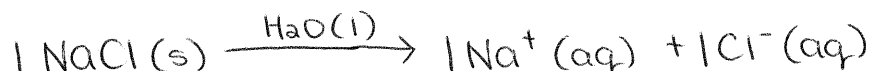
The separation of an ionic compound in H<sub>2</sub>O

### How do you complete a dissociation equation?

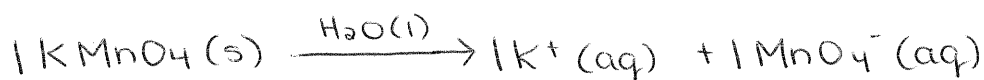
1. Write the ionic formula for the desired compound
2. Write an arrow with water above it (representing solvation)
3. Write the separated ions, including original charges of each ion as a superscript
4. Use aqueous notation behind each ion (due to solvation occurring)
5. Balance the ionic equation as normal balancing

### Dissociate the following ionic compounds

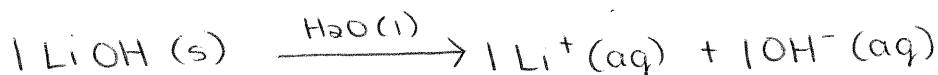
Sodium Chloride



Potassium permanganate



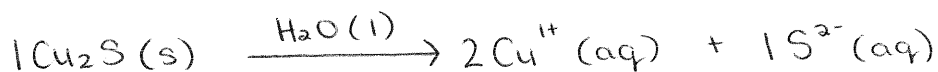
Lithium hydroxide



Calcium fluoride



Copper(I)sulfite



Iron(III)chlorate



Chromium nitrite



Aluminium iodide



## What is Ionization?

The separation of a molecular compound in water to produce  $\text{H}_3\text{O}^+$  and an ion.

## How do you complete a ionization equation?

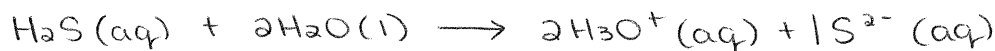
1. Write the molecular formula for the desired compound reacting with water
2. Write an arrow
3. Separate the compound, pulling off the Hydrogen and attaching it to the water to create hydronium (note there will be as many hydronium as there are hydrogens in the original molecule, which will require the same number of waters to react)
4. the remaining (not hydrogenated ion) will remain with its original charge (note: the charge should be the same number as how many hydrogens were lost from the original compound)
5. Use aqueous notation behind each ion (due to solvation occurring)
6. Balance the ionic equation as normal balancing
7. If no hydrogens are present on the original molecular compound, use 2 water molecules to produce a hydronium ion, add the remaining OH to the original molecular compound

## Ionize the following ionic compounds

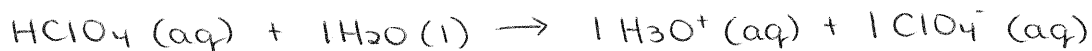
Acetic Acid



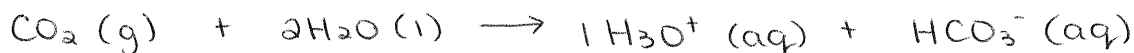
Hydrogen Sulfide



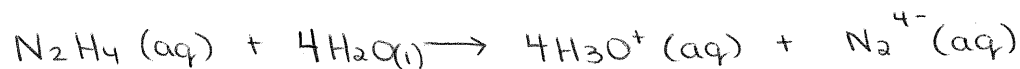
Perchloric acid



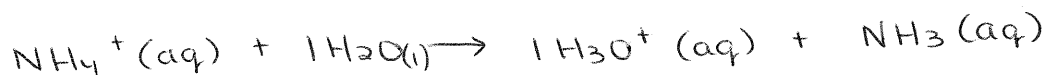
Carbon dioxide



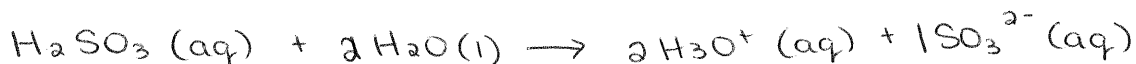
Dinitrogen tetrahydride



Ammonium



Sulfurous Acid



## Electrolytes vs Non Electrolytes

Electrolytes	Non electrolytes
Conduct electricity	Do not conduct electricity
Ionic compounds	Molecular compounds
Strong Acids	
Examples: HCl, HI NaCl, NaBr	Examples: CO <sub>2</sub> , sugar

### Mole Conversions:

When given a question in which you must find an amount given a different amount (i.e. given moles need to find grams) set it up as below:

**GOAL UNITS = given amount with units x convert to moles x convert to goal units**

In solutions

- when given grams, use molar mass to convert to moles
- when given litres, use molarity to convert to moles
- when given molecules, use Avogadro's to convert to moles
- when given density, use molar mass & volume to convert to moles

In gases,

- when given litres, use STP or SATP to convert to moles

These ideas are the same when you desire the units as well!!

GOAL UNITS = given amount with units x convert to moles x convert to goal units

Determine the number of grams required to create 240mL of a 1.283M solution of boric acid

$$\text{H}_3\text{BO}_3 \quad \#g = \frac{1.283 \text{ mol}}{\text{L}} \times 0.240 \text{ L} \times \frac{61.84 \text{ g}}{1 \text{ mol}} = 19.04 \text{ g} \quad \boxed{19 \text{ g}}$$

Determine the number of grams required to create 19mL of a 2.3840M solution of sodium iodide

$$\#g \text{ NaI} = \frac{2.384 \text{ mol}}{\text{L}} \times 0.019 \text{ L} \times \frac{149.89 \text{ g}}{1 \text{ mol}} = 6.789 \text{ g} \quad \boxed{6.8 \text{ g}}$$

Determine the molarity of 140mL solution of ethanoic acid created using 65mg of solid in preparation

$$\frac{\# \text{ mol}}{\text{L}} = 0.065 \text{ g} \times \frac{1 \text{ mol}}{60.06 \text{ g}} \times \frac{1}{0.140 \text{ L}} = 0.00773 \text{ M} \quad \boxed{7.7 \times 10^{-3} \text{ M}}$$

CH<sub>3</sub>COOH

Determine the molarity of potassium perchlorate in a 250mL volumetric flask using 15.39g of solid in preparation

$$\frac{\# \text{ mol}}{\text{L}} = 15.39 \text{ g} \times \frac{1 \text{ mol}}{138.55 \text{ g}} \times \frac{1}{0.250 \text{ L}} = 0.444316 \text{ M} \quad \boxed{0.44 \text{ M}}$$

Determine the molarity of a solution of copper(II)sulfate created using  $5.293 \times 10^{22}$  molecules and 2.45L of water

$$\frac{\# \text{ mol}}{\text{L}} = 5.293 \times 10^{22} \text{ molec} \times \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molec}} \times \frac{1}{2.45 \text{ L}} = 0.035887 \text{ M} \quad \boxed{0.0359 \text{ M}}$$

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Determine the number of litres required to make a 4.5M solution of aluminium oxide using 34.293g of solid

$$\#L = 34.293 \text{ g} \times \frac{1 \text{ mol}}{101.96 \text{ g}} \times \frac{1 \text{ L}}{4.5 \text{ mol}} = 0.0747417 \text{ L} \quad \boxed{0.075 \text{ L}}$$

Al<sub>2</sub>O<sub>3</sub>

Determine the number of litres required to make a 0.0300M solution of methanol using 8.3849g of solid

$$\#L = 8.3849 \text{ g} \times \frac{1 \text{ mol}}{32.05 \text{ g}} \times \frac{1 \text{ L}}{0.03 \text{ mol}} = 8.720645 \text{ L} \quad \boxed{8.72 \text{ L}}$$

CH<sub>3</sub>OH

Determine the molarity of mercury given its density is 13.6g/mL

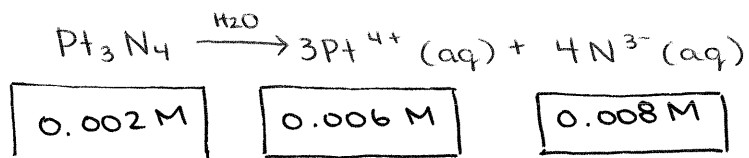
$$\frac{\text{mol}}{\text{L}} = \frac{13.6 \text{ g}}{\text{mL}} \times \frac{1 \text{ mol}}{200.59 \text{ g}} \times \frac{1000 \text{ mL}}{1 \text{ L}} = 67.79999 \text{ M} \quad \boxed{67.8 \text{ M}}$$

Determine the molarity of 0.70g/mL sugar (sucrose)

$$\frac{\text{mol}}{\text{L}} = \frac{0.70 \text{ g}}{1 \text{ mL}} \times \frac{1 \text{ mol}}{342.34 \text{ g}} \times \frac{1000 \text{ mL}}{1 \text{ L}} = 2.04475 \text{ M} \quad \boxed{2.0 \text{ M}}$$

Determine the concentration of a solution of platinum nitride created by measuring 1.2837g into 900mL of water. Using this information, determine the ion concentration of all ions present in solution.

$$\frac{\text{mol}}{\text{L}} = 1.2837 \text{ g} \times \frac{1 \text{ mol}}{641.28 \text{ g}} \times \frac{1}{0.90 \text{ L}} = 0.0022241974 \text{ M}$$



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List the steps to creating 250mL of a 6.0M solution of Zinc Sulfide

① Calculate Amount of Solute (ZnS)

$$\#g = \frac{6.0 \text{ mol}}{L} \times 0.250 L \times \frac{97.48g}{1 \text{ mol}} = 146.22 g$$

- ② Measure solid using scale
- ③ Combine solid with  $\frac{1}{2}$  solvent
- ④ Stir
- ⑤ Transfer to volumetric flask using funnel
- ⑥ Rinse all materials into flask and fill to line
- ⑦ Cap and Invert, check and refill.

This one is entirely James' fault.

