1. 💎 **STUDY CHECK**

Identify solute and solvent in the following mixture: (a) 10g of $H_2O(l)$ and 20g of $CH_3OH(l)$; (b) 1g of $I_2(s)$ and 100g of $CH_3CH_2OH(l)$

Show work to get full credit

2. 💎 **STUDY CHECK**

Classify the following molecules as polar or nonpolar: HF, Cl_2, C_2H_4, and C_2H_3Cl.

Show work to get full credit

3. 💎 **STUDY CHECK**

Use polarity arguments to indicate if the following substances will mix: (a) $H_2O_{(l)}$ and $CH_3Cl_{(l)}$; (b) $CH_3Cl_{(l)}$ and $CCl_{4(l)}$

Show work to get full credit

4. 💎 **STUDY CHECK**

(a) A solution is prepared by mixing 8g of NaCl (MW=74g/mol) with 250mL of H_2O. Calculate the molarity; (b) A KCl solution is prepared by mixing 5g of KCl with 200g of H_2O. Calculate the percent (m/m) of the solution.

Show work to get full credit

5. **STUDY CHECK**
How many grams of a 6% (m/m) solution do you need to provide 5 grams of solute.
Show work to get full credit

6. **STUDY CHECK**
How many liters of a 5M NaCl solution are required to prepare 3L of a 3M diluted NaCl solution.
Show work to get full credit

7. **STUDY CHECK**
For the following chemicals indicate whether you will have in the solution only ions, ions and some molecules, or molecules: (a) H_2SO_4, HNO_3 and CH_3OH.
Show work to get full credit

8. **STUDY CHECK**
Break down the following chemicals into ions, if possible: $H_2O_{(l)}$, $NH_{3(l)}$, $AgNO_{3(aq)}$.
Show work to get full credit

9. **STUDY CHECK**
Write down the ionic equation and net ionic for the following formula equation:

$$AgNO_{3(aq)} + NaBr_{(aq)} \longrightarrow AgBr_{(s)}\downarrow + NaNO_{3(aq)}$$

Show work to get full credit

10. **STUDY CHECK**
Calculate the redox number of the elements underlined in the following molecules: (a) $\underline{Cr_2}O_7^{2-}$ and (b) $\underline{Cr_2}O_3$
Show work to get full credit

11. **STUDY CHECK**
An oxygen sample has a pressure of 730 mmHg. Convert this value to atmospheres.
Show work to get full credit

12. **STUDY CHECK**
What is the pressure in atmospheres of a 1 L balloon containing 3 moles of Helium at 40C°.
Show work to get full credit

13. **STUDY CHECK**
What is the molecular mass of a 4 $g \cdot L^{-1}$ density gas at 30C° and 5 atm.
Show work to get full credit

14. **STUDY CHECK**

Calculate the grams in 4L of N_2 at STP conditions.
Show work to get full credit

15. **STUDY CHECK**

A 4 atm gas sample has a temperature of 300K. If we decrease its temperature to 200K at fixed volume and number of moles, calculate the final pressure of the gas.

Show work to get full credit

16. **STUDY CHECK**

Hydrogen gas reacts with nitrogen (MW=28 g/mol) gas to produce ammonia at STP conditions according to the following equation:

$$\underset{2L}{3\,H_2(g) + N_2(g)} \longrightarrow \underset{x\ g}{2\,NH_3(g)}$$

Calculate the number of grams of ammonia produced from 0.5L of nitrogen.
Show work to get full credit

17. **STUDY CHECK**

A mixture of gases with a total pressure of 5 atm contains 1 mol of Ar and 1 mol of He. Calculate the partial pressure of each component on the mixture.
Show work to get full credit

18. **STUDY CHECK**

Oxygen is collected over water in the decomposition of potassium chlorate:

$$2\,KClO_{3(s)} \longrightarrow 2\,KCl_{(s)} + 3\,O_{2(g)}$$

Given that 10mL of gas are collected at 35°C at a pressure of 0.5atm, and that the vapor pressure of water at that temperature is 0.0555 atm, calculate the number of moles of $KClO_3$ decomposed. Show work to get full credit

19. **STUDY CHECK**

Calculate the pressure of 0.9 moles of ammonia gas at 900K occupying a volume of 0.1L, using: (a) the ideal gas formula and (b) the Van der Waals formula $a = 4.17\text{atm} \cdot \text{L}^2/\text{mol}^2$ and $b = 0.0371\text{L/mol}$.
Show work to get full credit

20. **STUDY CHECK**

Calculate the root mean square velocity of the molecules of water at 25C°. Show work to get full credit