1. Calculate the mass of solute needed to prepare each 350 mL of 1.8 M NaOH solution.

2. What volume (mL) of a 4.0 M solution of HCl contains 12 g of solute?

3. A gas sample with a volume of 730 mL and pressure of 830 mmHg is at a temperature of 30.0°C. How many moles of gas does this sample contain?

4. How many grams of nitrogen gas has the same volume as 120 g of Ar gas at the same temperature and pressure?
5. If 75 mL of water is added to 120 mL of a 0.15 M NaOH solution, what will be the molarity of the final solution?

6. What volume (L) of 0.05 M HCl solution can be prepared by diluting 250 mL of 10 M HCl?

7. 350 mL of a 1.5 M NaCl solution is heated until the volume is reduced to 250 mL. What is the molarity of this solution?

8. How many grams of C₈H₁₈ are needed to produce 250 L of CO₂ gas at a temperature of 0 °C and a pressure of 752 mmHg?

\[
2 \text{C}_8\text{H}_{18} (g) + 25\text{O}_2 (g) \rightarrow 16\text{CO}_2 (g) + 18\text{H}_2\text{O} (g)
\]
9. Calculate the molar mass of a gas if 2.68 g of the gas occupies 2.00 L at 10.0°C and 764 mmHg.

10. A mixture of 11 g of CO₂ and 8.0 g of O₂ and an undetermined amount of H₂ occupies a volume of 22.4 L at 760 mmHg and 0°C. What mass of H₂ is present in this mixture?

11. What is the volume occupied by 35.4 g of nitrogen gas at 35 °C and 735 mmHg?

12. Write the symbols of the ions and formulas for their ionic compounds using the electron configurations given in the table below:

<table>
<thead>
<tr>
<th>Electron Configuration</th>
<th>Symbol of Ions</th>
<th>Metal</th>
<th>Non-metal</th>
<th>Cation</th>
<th>Anion</th>
<th>Formula of Compound</th>
</tr>
</thead>
<tbody>
<tr>
<td>1s²2s²2p⁶3s²</td>
<td>1s²2s²2p³</td>
<td></td>
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<tr>
<td>1s²2s²2p²3s²3p⁶4s²</td>
<td>1s²2s²2p⁶3s²3p³</td>
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</tr>
<tr>
<td>1s²2s²2p⁶3s²3p¹</td>
<td>1s²2s²2p⁵</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ANSWERS:
1) 25 g
2) 82 mL
3) 0.032 mol
4) 84 g
5) 0.092 M
6) 50 L
7) 2.1 M
8) 160 g
9) 31.0 g/mol
10) 1.0 g
11) 33.0 L