1. (10 points) Write the formula for and name the compound formed between the following pairs of ions.

<table>
<thead>
<tr>
<th>Formula</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Na and SO$_4^{2-}$</td>
<td>Na$_2$SO$_4$</td>
</tr>
<tr>
<td>Al and N</td>
<td>AlN</td>
</tr>
<tr>
<td>NH$_4^+$ and O</td>
<td>(NH$_4$)$_2$O</td>
</tr>
<tr>
<td>Fe$^{3+}$ and Br</td>
<td>FeBr$_3$</td>
</tr>
<tr>
<td>Ca and NO$_3^-$</td>
<td>Ca(NO$_3$)$_2$</td>
</tr>
</tbody>
</table>

2. (5 points) Name each of the following compounds.

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF$_3$</td>
</tr>
<tr>
<td>Fe$_2$S$_3$</td>
</tr>
<tr>
<td>BaI$_2$</td>
</tr>
<tr>
<td>SF$_4$</td>
</tr>
</tbody>
</table>

3. (2 points) Name each of the following as acids.

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI</td>
</tr>
<tr>
<td>H$_3$PO$_4$</td>
</tr>
</tbody>
</table>
4. (4 points) A compound is found to contain 40.27% K, 26.78% Cr, and 32.96% O. What is its empirical formula? Show your work.

\[
\begin{align*}
\text{K:} & \quad \frac{40.27}{39} = 1.033 \div 5.15 = 2 \\
\text{Cr:} & \quad \frac{26.78}{52} = 0.515 \div 5.15 = 1 \\
\text{O:} & \quad \frac{32.96}{16} = 2.06 \div 5.15 = 4 \\
\end{align*}
\]

K₂CrO₄

5. (4 points) Show your work on the following.

a. How many mol of NH₄⁺ are in 25.0-g of NH₄I?

\[
? \text{ mol NH}_4^+ = \frac{25.0 \text{ g NH}_4\text{I}}{145 \text{ g NH}_4\text{I}} = \frac{1}{0.172} \text{ mol NH}_4^+ = 0.172 \text{ mol NH}_4^+
\]

b. How many g of H are in 125.0-g of CH₄?

\[
? \text{ g H} = \frac{125.0 \text{ g CH}_4}{16 \text{ g CH}_4} = 31.25 \text{ g H}
\]