1. Write the chemical formula for the following substances. (10)

- lithium sulfate
- copper (I) sulfide
- arsenic
- iron (II) phosphate
- hydrochloric acid

2. Write the correct chemical name for the following substances. (10)

- NaHCO₃
- Fe(OH)₃
- NH₄NO₃
- H₂SO₄
- S₈

3. Classify as an element, compound, or ion. (5)

- C₄H₁₀
- C₆₀
- C⁻⁴
- SO₃
- CO₃⁻²

Good Luck!!!!
4. Complete the table below using the Periodic Table. (15)

<table>
<thead>
<tr>
<th>Element</th>
<th>Mass Number</th>
<th>Number Protons</th>
<th>Number Neutrons</th>
<th>Number Electrons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Br</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mn(^{+4})</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As(^{-3})</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cl(^{7})</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. How many milliliters does a 5.0-carat diamond occupy? The density of diamond is 3.5 g/mL. (10)

\[(1 \text{ carat} = 200 \text{ mg})\]

6. Record the length of the two objects below using the devices included. (10)

A

\[1 \text{ meter}\]

B

Ruler in centimeters
The Ajax Manufacturing Company makes plastic spheres of three different densities. One of the managers decided to collect the three products into one large container. The products need to be separated into the three different densities. Here is what you have to work with.

<table>
<thead>
<tr>
<th>Plastic Spheres</th>
<th>Soluble in water</th>
<th>Soluble in benzene</th>
<th>Soluble in alcohol</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>1.1 g/mL</td>
</tr>
<tr>
<td>B</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>0.9 g/mL</td>
</tr>
<tr>
<td>C</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>0.7 g/mL</td>
</tr>
</tbody>
</table>

The three plastics all have the same particle size or diameter. You have water (D = 1.0 g/mL), benzene (D = 0.9 g/mL), and alcohol (D = 0.8 g/mL) available.

Describe a separation process to isolate and recover the three different plastic spheres in dry condition. (10)