

Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.

Question #1: (4 points)

- Circle the ion(s) with a $[\text{Ar}]3d^5$ electron configuration: Co^{2+} Mn^{2+} Fe^{3+}
- Identify the neutral element with the ground state electron configuration $[\text{Xe}]4f^{14}5d^66s^2$. _____
- What is the oxidation state of iron in $\text{K}_4[\text{Fe}(\text{CN})_6]$? _____

Question #2: (6 points) Provide the right name or formula for the coordination compounds below.

Name	Formula
_____	$[\text{Cr}(\text{en})_2(\text{H}_2\text{O})_2]\text{SO}_4$
hexacarbonylruthenium(III) perchlorate	_____
dicyanobis(ethylenediamine)zirconium(IV) nitrate	_____

Question #3: Provide names or structures for the following organic molecules: (6 points)

3-methylhexane	2-pentanone	cyclobutyl bromide
structure:	structure:	structure:
<div></div>	<div></div>	<div></div>
$\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$	C_6H_6	$\text{CH}_3\text{-O-CH}_2\text{CH}_2\text{CH}_3$
name:	name:	name:
<div></div>	<div></div>	<div></div>

Question #4: Write two organic chemicals that you have used in the past. Include the names and the structures. (4 points)

Answers

Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.

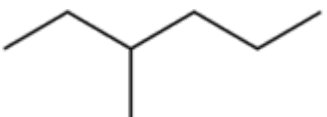
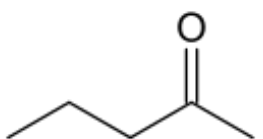
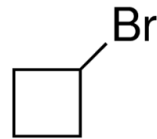
Question #1: (4 points)

- Circle the ion(s) with a $[\text{Ar}]3d^5$ electron configuration: Co^{2+} **Mn^{2+}** Fe^{3+}
- Identify the neutral element with the ground state electron configuration $[\text{Xe}]4f^{14}5d^66s^2$. **osmium**
- What is the oxidation state of iron in $\text{K}_4[\text{Fe}(\text{CN})_6]$? **+2**

Question #2: (6 points) Provide the right name or formula for the coordination compounds below.

Name	Formula
diaquabis(ethylenediamine)chromium(II) sulfate	$[\text{Cr}(\text{en})_2(\text{H}_2\text{O})_2]\text{SO}_4$
hexacarbonylruthenium(III) perchlorate	$[\text{Ru}(\text{CO})_6](\text{ClO}_4)_3$
dicyanobis(ethylenediamine)zirconium(IV) nitrate	$[\text{Zr}(\text{CN})_2(\text{en})_2](\text{NO}_3)_2$

Question #3: Provide names or structures for the following organic molecules: (6 points)

3-methylhexane <i>structure:</i> 	2-pentanone <i>structure:</i> 	cyclobutyl bromide <i>structure:</i> 
$\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ <i>name:</i> 1-propanol	C_6H_6 <i>name:</i> benzene	$\text{CH}_3\text{-O-CH}_2\text{CH}_2\text{CH}_3$ <i>name:</i> 1-methoxypropane

Question #4: Write two organic chemicals that you have used in the past. Include the names and the structures. (4 points)

answers will vary! Perhaps ethanol ($\text{C}_2\text{H}_5\text{OH}$), ammonia (NH_3), etc.