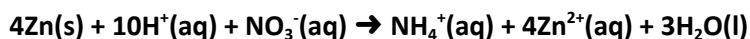


Oxidation Numbers

1. Consider the following reaction.



Nitrogen undergoes _____ and its oxidation number _____ by _____

a	Oxidation	Increases	8
b	Reduction	Decreases	8
c	Oxidation	Decreases	5
d	reduction	Increases	5

2. Harold and George consider four chemicals that contain **chlorine**.

I	NaClO₃
II	NaClO₄
III	Cl₂
IV	NaClO

They put the chemicals in order from the lowest oxidation number for chlorine to the highest oxidation number for chlorine. The correct order is ____, ____, ____, and ____

a	II, I, IV, III
b	III, IV, II, I
c	III, IV, I, II
d	I, II, IV, III

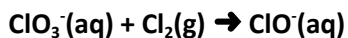
3. Mary and Sylvia assign oxidation numbers to the following compounds.



They find that the oxidation number of sulfur in the compounds in the order given will be ____, ____, ____, and ____.

a	+5	+4	-2	+2
b	-4	-4	+2	+3
c	+4	-6	+2	-2
d	+4	+6	-2	+2

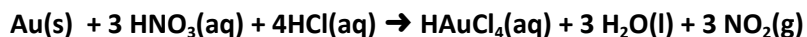
4. Aaron and Gerald are asked to balance the following reaction in an **acidic solution** using the smallest whole number coefficients possible.



The coefficient for the number of $\text{H}^+(\text{aq})$ used in the reaction will be ____ and this value will be found on the _____ side of the reaction.

a	2	Reactant
b	4	Product
c	2	Product
d	4	Reactant

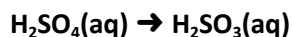
5. Consider the balanced reaction given below.



In this reaction, nitrogen undergoes _____ when its oxidation number changes from ____ to ____

a	Oxidation	+5	+4
b	Reduction	+5	+4
c	Oxidation	+4	+5
d	reduction	+4	+5

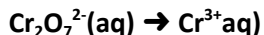
6. In the processing of acid rain, sulfates are converted to sulfites as indicated by the **incomplete and unbalanced half reaction**



In this half reaction the oxidation number of sulfur _____ and _____ occurs.

a	Decreases	Reduction
b	Increases	Oxidation
c	Decreases	Oxidation
d	Increases	Reduction

7. Wes and Krysten consider how dichromate ions convert to chromium (III) ions as shown below



In this half reaction, the oxidation number of chromium ____ and ____ occurs.

a	Increases	Oxidation
b	Decreases	Reduction
c	Decreases	Oxidation
d	Increases	Reduction

8. Marion considers the unbalanced oxidation reduction reaction given below.



She recognizes that this is a disproportionation equation. In the oxidation half reaction, the nitrogen atom changes its oxidation number from ____ to ____, while in the reduction half reaction; the nitrogen atom changes its oxidation number from ____ to ____

a	3	2	3	4
b	3	4	3	2
c	4	3	2	3
d	3	2	5	4

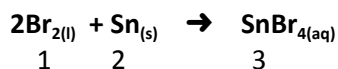
9. Jaycee and Samantha both study Chemistry 30 and Biology 30 so they are experts on cellular respiration. They know that in a cellular respiration reaction, ____ is the oxidizing agent and ____ is the reducing agent. They recognize that in calculating the enthalpy of a cellular respiration reaction, that water must be in the ____ state.

a	Carbon	Oxygen	Liquid
b	Oxygen	Carbon	Liquid
c	Carbon	Oxygen	Gaseous
d	Oxygen	Carbon	Gaseous

10. **Numerical response question:** Left justify your answer in the boxes provided.

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Each chemical reagent in the reaction below is assigned a number



Using the assigned numbers, complete the boxes as indicated:

1st box: oxidizing agent

2nd box: reducing agent

3rd box: oxidation number of bromine

4th box: oxidation number of tin ion

11. **Numerical response question:** Left justify your answer in the boxes provided.

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For the following compound, determine the oxidation number for carbon.
Place your answer(s) in the box that is indicated.

$\text{CS}_{2(s)}$
Box 1

$\text{CH}_{4(g)}$
Box 2

$\text{CO}_{2(g)}$
Box 3

$\text{C}_2\text{H}_{6(g)}$
Box 4

(you do not need to record if the oxidation numbers are positive or negative)

Solutions:

1. B
2. C
3. D
4. B
5. B
6. A
7. B
8. B
9. B
10. 1204
11. 4443