

1. If element  $X$  forms the oxides  $XO$  and  $X_2O_3$ , the oxidation numbers of element  $X$  are  
 (A) +1 and +2 (C) +1 and +3  
 (B) +2 and +3 (D) +2 and +4

2. In which compound does chlorine have the highest oxidation number?  
 (A)  $KClO$   
 (B)  $KClO_2$   
 (C)  $KClO_3$   
 (D)  $KClO_4$

3. In which compound does chlorine have an oxidation number of +5?  
 (A)  $HClO$   
 (B)  $HClO_2$   
 (C)  $HClO_3$   
 (D)  $HClO_4$

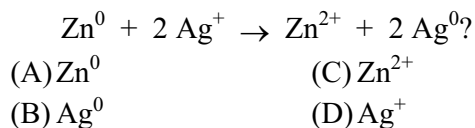
4. What is the oxidation number of iodine in  $NaIO_3$ ?  
 (A) +1 (C) +3  
 (B) +5 (D) +6

5. What is the sum of the oxidation numbers of the atoms in the compound  $CO_2$ ?  
 (A) 0 (C) -4  
 (B) -2 (D) +4

6. What is the oxidation number of Pt in  $K_2PtCl_6$ ?  
 (A) -2 (C) -4  
 (B) +2 (D) +4

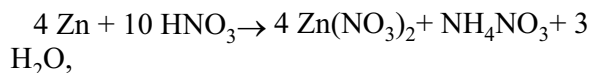
7. What is the oxidation number of nitrogen in  $HNO_2$ ?  
 (A) -1 (C) +3  
 (B) -2 (D) +4

8. What species is reduced in the reaction below?



9. All redox reactions involve  
 (A) the gain of electrons, only  
 (B) the loss of electrons, only  
 (C) both the gain and the loss of electrons  
 (D) neither the gain nor the loss of electrons

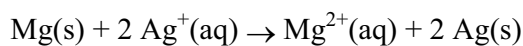
10. In the reaction



the zinc is

(A) reduced and the oxidation number changes from 0 to +2  
 (B) oxidized and the oxidation number changes from 0 to +2  
 (C) reduced and the oxidation number changes from +2 to 0  
 (D) oxidized and the oxidation number changes from +2 to 0

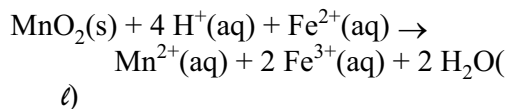
11. Base your answer to the following question on the following reaction.



Which species undergoes a loss of electrons?

(A)  $Mg(s)$  (C)  $Mg^{2+}(aq)$   
 (B)  $Ag^+(aq)$  (D)  $Ag(s)$

12. Given the reaction:

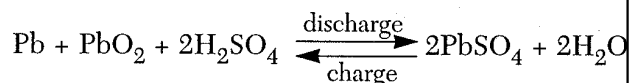


Which species is oxidized?

(A)  $H^+(aq)$   
 (B)  $H_2O(\ell)$   
 (C)  $Fe^{2+}(aq)$   
 (D)  $MnO_2(s)$

## Redox Worksheet #2

13. The equation below represents the reaction for a lead-acid battery.



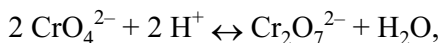
Which species is oxidized during the discharge of the battery?

- (A) Pb
- (B) PbO<sub>2</sub>
- (C) PbSO<sub>4</sub>
- (D) H<sub>2</sub>SO<sub>4</sub>

14. When 1 mole of Ni<sup>3+</sup> changes to Ni<sup>2+</sup>, the Ni<sup>3+</sup> undergoes

- (A) oxidation by losing electrons
- (B) oxidation by gaining electrons
- (C) reduction by losing electrons
- (D) reduction by gaining electrons

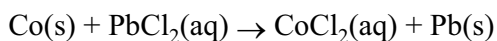
15. In the equation



the oxidation number of chromium

- (A) decreases
- (B) increases
- (C) remains the same

16. Given the redox reaction:



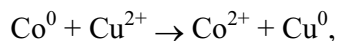
Which statement correctly describes the oxidation and reduction that occur?

- (A) Co(s) is oxidized and Cl<sup>-</sup>(aq) is reduced
- (B) Co(s) is oxidized and Pb<sup>+2</sup>(aq) is reduced
- (C) Co(s) is reduced and Cl<sup>-</sup>(aq) is oxidized
- (D) Co(s) is reduced and Pb<sup>+2</sup>(aq) is oxidized

17. Oxidation-reduction reactions occur because of the competition between particles for

- (A) neutrons
- (B) electrons
- (C) protons
- (D) positrons

18. In the reaction



which species is reduced?

- (A) Co<sup>0</sup>
- (B) Cu<sup>0</sup>
- (C) Co<sup>2+</sup>
- (D) Cu<sup>2+</sup>

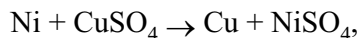
19. Which oxidation number change could occur during an oxidation of an element?

- (A) +1 to -1
- (B) -2 to -3
- (C) +3 to +1
- (D) +2 to +3

20. A redox reaction always involves

- (A) a change in oxidation number
- (B) a change of phase
- (C) the transfer of protons
- (D) the formation of ions

21. In the reaction



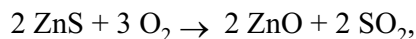
each nickel atom

- (A) loses one electron, only
- (B) loses two electrons
- (C) gains one electron, only
- (D) gains two electrons

22. Which is true when an Sn<sup>2+</sup> ion is reduced?

- (A) Its oxidation number increases.
- (B) It gains electrons.
- (C) Its mass decreases.
- (D) It acts as a reducing agent.

23. In the reaction



the oxidation number of sulfur changes from

- (A) 0 to -2
- (B) -2 to +4
- (C) -2 to +6
- (D) +2 to +4