

## Oxidation Reduction Practice Quiz (Chapter 4.9 and 4.10)

1. In which of the following does nitrogen have an oxidation state of +4?

- a)  $\text{HNO}_3$       b)  $\text{NO}_2$       c)  $\text{N}_2\text{O}$       d)  $\text{NH}_4\text{Cl}$       e)  $\text{NaNO}_2$

2. Which of the following statements is *not* true?

- a) When a metal reacts with a nonmetal, an ionic compound is formed.
- b) A metal-nonmetal reaction can always be assumed to be an oxidation-reduction reaction.
- c) Two nonmetals can undergo an oxidation-reduction reaction.
- d) When two monometals react, the compound formed is ionic.
- e) A metal-nonmetal reaction involves electron transfer.

3. In the reaction  $2\text{Ca(s)} + \text{O}_2\text{(g)} \rightarrow 2\text{CaO(s)}$ , which species is oxidized?

- a)  $\text{O}_2$
- b)  $\text{O}^{2-}$
- c) Ca
- d)  $\text{Ca}^{2+}$
- e) none of these

4. In the reaction  $2\text{Cs(s)} + \text{Cl}_2\text{(g)} \rightarrow 2\text{CsCl(s)}$ ,  $\text{Cl}_2$  is

- a) the reducing agent.
- b) the oxidizing agent.

5. In the reaction  $\text{N}_2\text{(g)} + \text{H}_2\text{(g)} \rightarrow 2\text{NH}_3\text{(g)}$ ,  $\text{N}_2$  is

- a) oxidized.
- b) reduced.

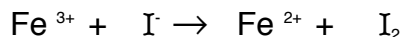
6. In the reaction  $\text{P}_4\text{(s)} + 10 \text{Cl}_2\text{(g)} \rightarrow 4\text{PCl}_5\text{(s)}$ , the reducing agent is

- a) chlorine
- b)  $\text{PCl}_5$
- c) phosphorus
- d)  $\text{Cl}^-$
- e) none of these

7. In the reaction  $\text{C(s)} + \text{O}_2\text{(g)} \rightarrow \text{CO}_2\text{(g)}$  carbon is \_\_\_\_.

- a) the reducing agent
- b) the electron acceptor
- c) reduced
- d) the oxidizing agent
- e) more than one of these

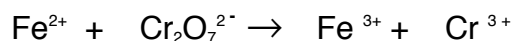
8. Consider the following oxidation-reduction reaction:



In the balanced equation, the coefficient of  $\text{Fe}^{2+}$  is

- a) 1. b) 2. c) 3. d) 4. e) none of these

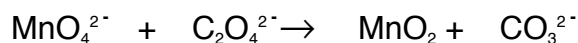
9. Given the following reaction in acidic media:



The coefficient for water in the balanced reaction is

- a) 1. b) 3. c) 5. d) 7. e) none of these

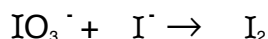
10. The following unbalanced equation represents a reaction that occurs in basic solution:



How many moles of  $\text{MnO}_4^{2-}$  are required to produce 1 mole of  $\text{CO}_3^{2-}$ ?

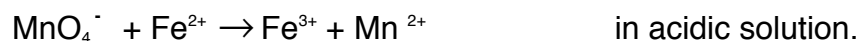
- a) 4. b) 3. c) 2. d) 1. e) none of these

11. When the following reaction is balanced in acidic solution, what is the coefficient of  $\text{I}_2$ ?



- a) 1      b) 2      c) 3      d) 4      e) 5

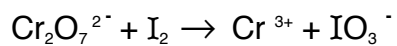
12. The  $\text{MnO}_4^-$  ion is often used to analyze for the  $\text{Fe}^{2+}$  content of an aqueous solution via the reaction of



What is the ratio of  $\text{MnO}_4^-$  :  $\text{Fe}^{2+}$  in the balanced equation?

- a) 1:1      b) 1:2      c) 1:3      d) 1:4      e) 1:5

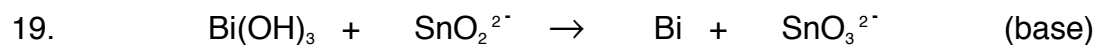
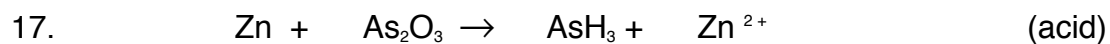
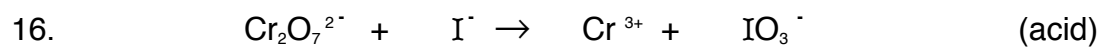
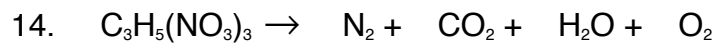
13. Balance the following oxidation-reduction reaction:



In the balanced equation, the coefficient of water is:

- a) 4      b) 17      c) 11      d) 7      e) 6

Balance each of the following equations:



## Answers

1. b
2. d
3. c
4. b
5. b
6. c
7. a
8. b
9. d
10. e
11. c
12. e
13. b
14. 4,  $\rightarrow$  6, 12, 10, 1
15. 6, 8,  $\rightarrow$  6, 2, 3, 4
16.  $8\text{H}^+$ , 1, 1,  $\rightarrow$  2, 1,  $4\text{H}_2\text{O}$
17.  $12\text{H}^+$ , 6, 1,  $\rightarrow$  2, 6,  $3\text{H}_2\text{O}$
18.  $\text{H}_2\text{O}$ , 2, 1,  $\rightarrow$  2, 1,  $2\text{OH}^-$
19. 2, 3,  $\rightarrow$  2, 3,  $3\text{H}_2\text{O}$