

Mine Gases General Review

(Pages 2-49 thru 2-51)

Choose the correct answer to each of the following questions:

1. Normal air contains approximately what percent oxygen?
 - a. 15%
 - b. 21%
 - c. 31%
 - d. 79%

2. The explosive range of a methane/air mixture (normally 5-15%) will change if:
 - a. certain other combustible gases are present.
 - b. coal dust is suspended in the atmosphere.
 - c. there is less than 12.1% oxygen in the atmosphere.
 - d. all of the above.

3. Carbon monoxide is:
 - a. a gas found in all mining operations
 - b. a normal constituent of air
 - c. detected during a mine fire or explosion
 - d. a product of the breathing process

4. An elevated concentration of carbon dioxide in mine air can be harmful because:
 - a. it is highly explosive
 - b. it increases the breathing rate
 - c. it is highly toxic in small concentrations
 - d. all of the above

5. An elevated concentration of nitrogen in mine air can be harmful because:
 - a. it can lower the oxygen content of the air
 - b. it is highly explosive
 - c. it is highly toxic
 - d. all of the above

6. Oxides of nitrogen can occur in a mine atmosphere:
 - a. when certain explosives are used
 - b. when diesel-powered equipment is being used
 - c. when electric equipment produces arcs or sparks
 - d. all of the above

7. Accumulations of hydrogen in the mine atmosphere are dangerous because hydrogen:
- is highly toxic
 - is highly soluble in water
 - is highly explosive
 - gives off a suffocating odor
8. Characteristics of hydrogen sulfide include:
- explosive
 - highly toxic
 - can be liberated from pools of stagnant water
 - all of the above
9. Which of the following is not true of sulfur dioxide?
- it is explosive
 - it is highly toxic
 - it is highly soluble in water
 - it can occur during mine fires
10. The most likely source of ethane, propane, or butane in a mine is:
- use of diesel equipment
 - battery charging stations
 - leakage from adjacent gas or oil wells
 - all of the above
11. Acetylene would normally be found in a mine atmosphere where:
- diesel equipment is used
 - methane has burned or exploded in air with a lowered oxygen content
 - leakage has occurred from adjacent oil or gas wells
 - battery charging stations are located
12. Match each damp with its components:
- | | |
|--------------|---|
| 1. Firedamp | a. Carbon monoxide and air |
| 2. Blackdamp | b. Hydrogen sulfide and air |
| 3. Afterdamp | c. Carbon dioxide, nitrogen, and air |
| 4. Whitedamp | d. Carbon monoxide, carbon dioxide, methane, oxygen, nitrogen, and hydrogen |
| 5. Stinkdamp | e. Methane and air |

13. Mine rescue teams are required by Federal law to have available:
 - a. one detecting device for every gas listed as dangerous by the U. S. Bureau of Mines
 - b. one detecting device for each gas normally encountered in the mine(s) the team serves
 - c. four detecting devices for each gas normally encountered in the mine(s) the team serves
 - d. one detecting device for each team member

14. Atmospheric pressure and temperature are important factors because they:
 - a. affect the rate of diffusion of a gas by ventilation
 - b. can cause false readings on gas detection instruments
 - c. lower oxygen content in the mine
 - d. all of the above

15. Two gases that are highly soluble in water are:
 - a. methane and acetylene
 - b. hydrogen sulfide and hydrogen
 - c. nitrogen and sulfur dioxide
 - d. hydrogen sulfide and sulfur dioxide

16. A gas that is normally found near the roof or in high places in the mine is said to have a low:
 - a. level of toxicity
 - b. level of explosivity
 - c. specific gravity
 - d. level of solubility

17. The amount of coal dust suspended in the mine atmosphere is most important because:
 - a. it can alter the explosive range of methane.
 - b. it can affect the specific gravity of oxygen.
 - c. hydrogen is liberated from the coal dust.
 - d. coal dust lowers the oxygen content in the mine atmosphere.

18. A nontoxic gas can still be dangerous because it can:
 - a. displace oxygen
 - b. burn
 - c. explode
 - d. all of the above

19. The type of coal mine where the greatest amount of methane would be likely to be found would be a:
 - a. drift mine with tight and compact adjoining strata
 - b. drift mine with loose or broken adjoining strata
 - c. shaft mine with tight and compact adjoining strata
 - d. shaft mine with loose or broken adjoining strata

20. Gases that are neither toxic nor explosive:
- a. are not found in mine atmospheres
 - b. are not dangerous
 - c. can be dangerous because they can displace oxygen
 - d. cannot be detected with today's detection instruments

GENERAL REVIEW ANSWER KEY (IG XX pages 2-52)

- 1. **b**
- 2. **d**
- 3. **c**
- 4. **b**
- 5. **a**
- 6. **d**

- 7. **c**
- 8. **d**
- 9. **a**
- 10. **c**
- 11. **b**

- 12.
- 1) **e**
- 2) **c**
- 3) **d**
- 4) **a**

- 13. **c**
- 14. **a**
- 15. **d**
- 16. **c**
- 17. **a**
- 18. **d**
- 19. **c**
- 20. **c**