Pennsylvania Mining Law
Questions and Answers

Mine Gases

61. The explosive range of methane is _____.

    A. 2% to 10%
    B. 2% to 15%
    C. 5% to 15%
    D. 5% to 10%

62. A flame safety lamp will go out when the oxygen percentage falls below _____.

    A. 19.5%
    B. 17%
    C. 16.5%
    D. 16%

63. The explosive range of carbon monoxide is _____.

    A. 5% to 15%
    B. 4.5% to 74%
    C. 12.5% to 74%
    D. carbon monoxide is not explosive

64. Hydrogen sulfide is a gas that smells like rotten eggs.

    A. true
    B. false

65. The specific gravity of carbon dioxide is _____.

    A. 0.555
    B. 0.967
    C. 1.192
    D. 1.529

66. The ignition temperature of carbon monoxide is 1380 degrees F.

    A. true
    B. false

67. Carbon monoxide unites with the _____ of the blood.

A. red blood cells
B. white blood cells
C. hemoglobin
D. platelets

68. _____ of carbon monoxide will produce symptoms of unconsciousness in 30 minutes.

A. 200-300 ppm
B. 400-600 ppm
C. 1000-2000 ppm
D. 2000-3000 ppm

69. Workers should not be employed for a period of 8 hours where the carbon monoxide content exceeds _____.

A. 5 ppm
B. 10 ppm
C. 50 ppm
D. 100 ppm

70. The least percentage of methane that can be detected with a flame safety lamp is _____.

A. 0.25%
B. 0.5%
C. 1.0%
D. methane cannot be detected with a flame safety lamp

71. The specific gravity of methane is _____.

A. 0.555
B. 0.967
C. 1.192
D. 1.529

72. Methane needs to have oxygen present to be explosive.

A. true
B. false

73. Maximum explosive violence of methane is at _____.

A. 5%
B. 8%
C. 10%
D. 15%

74. No explosion of a methane-air mixture can occur if the oxygen level falls below _____.

A. 19.5%
B. 16%
C. 14.5%
D. 12%

75. When a methane explosion unites with coal dust, it becomes less violent.

A. true
B. false

76. In a mine environment, methane is most likely to be found _____.

A. near the bottom
B. near the roof
C. in return areas only
D. in intake areas only

77. _____% of carbon monoxide can cause death in less than one hour.

A. 4.0%
B. 0.4%
C. 2.0%
D. 0.2%

78. How does of nitrogen cause death?

A. cause fluids to be built up in the lungs
B. combines with hemoglobin in the blood
C. causes massive bleeding
D. creates air embolisms in the bloodstream

79. Which is not a source of hydrogen in coal mines?

A. mine fires
B. explosions
C. charging batteries
D. rotting timber

80. The chemical symbol for methane is _____.

A. H_2S
B. CH_4
C. N_2
D. N_2S

81. The chemical symbol for hydrogen sulfide is _____.

A. H_2S
B. CH_4
C. N_2
D. N_2S

82. What percentage of the earth's atmosphere is oxygen?

A. 78.09%
B. 16.5%
C. 4.25%
D. 20.94%

83. What percentage of the earth's atmosphere is nitrogen?

A. 78.09%
B. 16.5%
C. 4.25%
D. 20.94%

84. If two or more gases mix uniformly, will they separate or come apart?

A. yes
B. no

85. The chemical symbol for carbon dioxide is _____.

A. CO
B. CH_4
C. CO_2
D. C_2H_4

86. What element in the air is essential to life?

A. hydrogen
B. nitrogen
C. helium
D. oxygen

87. The term black damp means _____.

A. moist air in a coal mine
B. oxygen deficient
C. after effects of a mine explosion
D. wet coal

88. Methane can be detected by _____.

A. chemical analysis
B. CH_4 detector
C. all of the above

89. The explosive range of carbon monoxide is _____.

A. 4.3% to 45%
B. 5% to 15%
C. 9% to 11%
D. 12.5% to 74%

90. _____ is a flammable mixture of methane and air which can either burn or explode when ignited.

A. blackdamp
B. whitedamp
C. firedamp
D. stinkdamp

91. A sealed area of a coal mine after a period of time will be found to have the absence of _____.

A. nitrogen
B. oxygen
C. carbon dioxide
D. hydrogen

92. Oxides of nitrogen in coal mines are formed by _____.

A. rotting wood
B. charging batteries
C. use of explosives
D. none of the above

93. The ignition temperature of methane is _____.

A. 500 to 1500 degrees F
B. 900 to 1100 degrees F
C. 1100 to 1380 degrees F
D. 1100 to 1300 degrees F

94. The ignition temperature of carbon monoxide is _____.

A. 900 degrees F
B. 1100 degrees F
C. 1380 degrees F
D. carbon monoxide is not combustible

95. What is the specific gravity of hydrogen?

A. 0.0695
B. 0.555
C. 1.091
D. 1.529

96. The explosive range of hydrogen is _____.

A. 5% to 15%
B. 4.3% to 45%
C. 12.5% to 74%
D. 4.1% to 74%

97. Hydrogen is detected by chemical analysis.

A. true
B. false

98. The principal poisonous gas produced by an explosion is _____.

A. methane
B. carbon monoxide
C. carbon dioxide
D. hydrogen sulfide

99. What percentage of carbon monoxide will produce slight symptoms after several hours?

A. 100 ppm (.01%)
B. 200 ppm (.02%)
C. 300 ppm (.03%)
D. 400 ppm (.04%)

100. What percentage of carbon monoxide will produce discomfort in 2 or 3 hours?

A. 400 ppm (.04%)
B. 600 ppm (.06%)
C. 800 ppm (.08%)
D. 1000 ppm (.1%)

101. The chemical symbol for carbon monoxide is _____.

A. CO
B. C_2O
C. CO_2
D. C_2O_2

102. What percent of carbon monoxide will produce a tendency to stagger in 90 minutes?

A. 1000 ppm (.1 %)
B. 1200 ppm (.12%)
C. 1400 ppm (.14%)
D. 1600 ppm (.16%)

103. What percentage of carbon monoxide will render a person unconscious in 30 minutes?

A. 1200 to 1600 ppm (.12% to .16%)
B. 1600 to 2000 ppm (.16% to .2%)
C. 2000 to 2500 ppm (.2% to .25%)
D. 2500 to 3000 ppm (.25% to .3%)

104. How much greater affinity does hemoglobin have for carbon monoxide than oxygen?

A. 100 times
B. 200 times
C. 300 times
D. 400 times

105. Why are small amounts of carbon monoxide injurious?

A. a small amount can build up a large amount of fluid in the lungs
B. carbon monoxide is not easily dispelled from the bloodstream
C. a small embolism in the bloodstream can kill
D. a small amount can cause a massive hemorrhage

106. The specific gravity of carbon monoxide is _____.

A. 0.967
B. 1.091
C. 1.529
D. 1.259

107. Carbon monoxide can be detected with a flame safety lamp.

A. true
B. false

108. Carbon monoxide is colorless, odorless, tasteless, combustible and poisonous.

A. true
B. false

109. Workers should not be employed for a period of 8 hours where the carbon monoxide level exceeds _____.

A. 25 ppm (.0025%)
B. 50 ppm (.005%)
C. 75 ppm (.0075%)
D. 100 ppm (.01%)

110. What percent of carbon monoxide might produce symptoms of poisoning if breathed indefinitely?

A. 0.01%
B. 0.02%
C. 0.03%
D. 0.04%

111. Carbon monoxide is the product of incomplete combustion.

A. true
B. false

112. Convert 0.01% of carbon monoxide to ppm.

A. 10 ppm
B. 100 ppm
C. 1000 ppm
D. 10000 ppm

113. What percentage of blood saturation by carbon monoxide will cause death?

A. 5% to 15%
B. 30% to 40%
C. 60% to 70%
D. 70% to 80%

114. What is the specific gravity of methane?

A. 0.555
B. 0.967
C. 1.091
D. 1.529

115. Methane is found in the coal seam and the surrounding strata.

A. true
B. False

116. There can be no methane explosion when the methane content is over 15%.

A. true
B. false

117. What is the percentage of oxygen below which no explosion of methane and air mixture can occur?

A. 19%
B. 15%
C. 12%
D. 10%

118. A greater percentage of methane is necessary to start an explosion in an atmosphere which contains less than the normal percentage of oxygen.

A. true
B. false

119. What effect does the presence of methane have upon the explosability of coal dust?

A. it has no effect
B. the coal dust becomes harder to ignite because methane is more volatile
C. the coal dust ignites quickly, but the force is diminished
D. the coal dust ignites more easily and the force of the explosion is greater

120. One cubic foot of methane is lighter than one cubic foot of air.

A. true
B. false