

Mine Gases

1. 1 % of the earth's atmosphere is equal to _____ ppm.
2. Outside air contains ___% oxygen (round to nearest whole number).
3. Outside air contains roughly ___% nitrogen (round to nearest whole number).
4. Which of the following deadly gases are commonly found in underground mines? a)phosgene, b) acetylene, c)benzene, d)hydrogen sulfide, e)carbon monoxide, f)carbon dioxide, g)hydrogen cyanide, h) ammonia
5. Sulfur dioxide results from: a) combustion of diesel fuel, b) heating some ores, c) reaction of hydrogen & oxygen.
6. The molecular weight of a mine gas can be used to help determine where it will be found in a confined space. True ____, False ____
7. The molecular weight of oxygen and nitrogen are twice their atomic weights. True ____, False ____
8. Threshold Limit Value (TLV) means the 8-hour time-weighted average concentration to which a worker may be exposed without ill effects over his/her working lifetime (assuming 8 hours/day, 5 days/week). True ____, False ____
9. M/NM mine PELs are based on current TLVs. True ____, False ____
10. A C value in the TLV is a limit that should never be exceeded. True ____, False ____
11. MSHA issues citations when the current TLV is exceeded. True ____, False ____.
12. The concentration at which an airborne substance becomes toxic to an exposed person is: a) TLV, b) PEL, c) IDLH
13. Hydrogen sulfide originates from a) sulfide ores, b) sump areas, c) acid mine water, d) decaying organic matter
14. The TLV for hydrogen sulfide is: a) 10 ppm, b) 50 ppm, c)100 ppm, d) 500 ppm
15. Oxygen concentrations in the mine air may be reduced to dangerous levels by: a) degradation of organic matter, b) production of methane, c) internal combustion engines, d) persons breathing
16. Too high an oxygen concentration is dangerous. True ____, False ____
17. The minimum oxygen concentration in the air that underground miners breath is 21 %, True ____, False ____
18. Dizziness and headache occur when the oxygen concentration drops below ___%
19. Loss of consciousness occurs when the oxygen concentration drops below ___%
20. Hydrogen sulfide is safe to be around because an exposed person can detect its rotten-egg smell whenever it poses a danger. True ____, False ____
21. Hydrogen sulfide: a) has a TLV that is 1/5th that of carbon monoxide, b) produces rapid death at concentrations as low as 0.07 %, c) rapidly deadens the sense of smell making persons insensitive to its rotten egg odor.
22. The primary concern with carbon monoxide is its explosive nature. True ____, False ____
23. Carbon monoxide suffocates the victim. True ____, False ____
24. Carbon monoxide is produced by: a) any fire, b) any internal combustion engine, c) persons breathing.
25. 0.15 % carbon monoxide is immediately dangerous to life and health. True ____, False ____
26. The PEL for carbon monoxide is equivalent to an average exposure level of 50 ppm for 8 hours. True ____, False ____
27. TLVs published in the year ____ contain PELs for atmospheric contaminants in the air miner's are exposed to.
28. Carbon dioxide is: a) the gas people exhale, b) a major product of virtually all combustion, c) causes breathing to increase by more than 300 % when present in the air at 5 % or higher, d) has a TLV of 0.50 %
29. Nitrogen dioxide: a) is not a concern in underground mines, b) has an enforced ceiling limit of 5 ppm, c) is immediately dangerous to life and health at 50 ppm, d) causes a slow death.
30. Nitrogen dioxide is produced in: a) agricultural silos, b) diesel combustion, c) blasting, d) electrical arcs, e) the reddish-brown gas produced by dissolving copper in nitric acid.
31. Ammonia: a) has a pungent odor, b) has a TLV lower than the TLV for carbon monoxide, c) is explosive when present in concentrations exceeding 15 %, d) can cause severe respiratory paralysis.
32. The primary methods used to control mine air concentrations of toxic gases is: a) not produce them, b) exhaust purifiers, c) cleaner engines, d) changing air filters, e) water sprays, f) respirators, g) ventilation

Answers:

- 1)10,000, 2)21, 3)78, 4)def,possibly b, 5) a,b, 6)T, 7)T, 8)T, 9)F, 10)T, 11)F, 12)c, 13)abcd, 14)a, 15)abcd, 16)T, 17)F, 18)15%, 19)9%, 20)F, 21)abc, 22)F, 23)T, 24)ab, 25)T, 26)T, 27)1973, 28)abcd, 29)bcd, 30)abcde, 31)abcd, 32)bcd