

Chapter 17 Air Pollution Environmental Science AP

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1. Describe three significant differences between the troposphere and the stratosphere:
2. Why is the troposphere thicker over equatorial regions than it is over the poles?
3. Identify the five most abundant gases in the troposphere, giving the approximate percentage for each.
4. Contrast the “natural greenhouse effect” and the “enhanced greenhouse effect”:
Include: (a) the two dominant, naturally occurring greenhouse gases: and (b) the five major anthropogenic greenhouse gases:
5. Contrast “beneficial ozone” and “bad ozone”:
6. Discuss how human actions have disrupted the following biogeochemical cycles:
 - Carbon cycle
 - Nitrogen cycle
 - Sulfur cycle
7. How does a **primary** pollutant differ from a secondary **pollutant**? Include three examples for each of these pollutant categories:
8. Identify eight major classes of air pollutants:
9. Outline the chemical transformations which occur in the formation of **photochemical smog**:
10. Provide the following information for each of the **outdoor** air pollutants below:

Air Pollutant Summary Table

Pollutant	Brief Description	Major Human Source	Health Effects
*CO			
NOx			
SO₂			
SPM			
O₃			
Pb			

11. (* Note: Although identified here and in texts as an “outdoor” air pollutant, it is also an “ indoor” air pollutant.)
12. Outline the chemical transformations involved in the formation of **sulfuric acid** from coal and oil combustion:
13. What gives gray-air smog the gray coloration?
14. Using Figure 17-6 on page 424, explain why the O₃ curve appears as it does:
15. Identify five factors which influence the formation of Photochemical and Industrial smog:
16. Describe how a temperature inversion occurs:
17. Contrast a subsidence temperature inversion and a radiation temperature inversion:
18. Explain why natural precipitation is acidic:
19. Contrast wet and dry acid deposition:
20. The worst acid deposition is taking place in what part of the world?
21. Describe three specific **economic** impacts of acid deposition:
22. Describe three specific ecological impacts of acid deposition on **aquatic ecosystems** .

23. Describe three specific impacts of acid deposition on **plants**.
24. Describe three specific impacts of acid deposition on **soil chemistry**.
25. Explain why mountain biomes are hit especially hard by acid deposition:
26. Summarize the trend that is presented in Figure 17-13 on page 430.
27. Identify eight ways to **prevent** acid deposition and two ways to **clean it up**:
28. Define “sick building syndrome”
29. Provide the following information for each of the **indoor** air pollutants below:

Pollutant	Brief Description	Major Source	Human Health Effects
Formaldehyde			
“Tobacco smoke”			
Radon-222			
Asbestos			
Carbon monoxide			
Nitrogen oxides			

- 30.
31. Identify three ways to either prevent or reduce indoor air pollution:
32. Briefly comment on the *Waldsterben* phenomenon:
33. Identify the six outdoor criteria pollutants for which the EPA has established *National ambient air quality standards (NAAQS)*.
34. How do the *primary standards* differ from the *secondary standards (NAAQS)*?
35. Discuss three ways in which United States air pollution legislation could be improved:
36. Describe the *emissions trading policy*:
37. Identify **(A)** three prevention and **(B)** three cleanup approaches for reducing emissions of SO₂, NO₂, and PM from stationary sources such as coal-burning electric power plants.
38. Identify four commonly used methods for removing particulates from the exhaust gases from electrical power/industrial plants:
39. Of the four methods named in #36 above, which of these is also effective in removing sulfur dioxide emissions?
40. Briefly describe four *global approaches* to protecting air quality: (pp. 443-444.)