

Environmental Chemistry Unit Review Sheet

Directions: Answer all questions on a separate piece of paper in complete sentences.

Nuclear Energy:

1. Name the 4 types of nuclear radiation.
2. Explain in detail why some nuclei are unstable. Be sure to include any forces involved.
3. What makes a substance "radioactive"?
4. Compare and contrast nuclear fission and nuclear fusion.
5. What was shown in the "Hunting the Elements" video to demonstrate a chain reaction?
6. Which type of nuclear reaction is used in power plants? Which type of nuclear reaction occurs on the Sun?
7. Why does nuclear waste have to be stored? Where should it be stored?

Alternative Energy:

8. Explain the difference between renewable and nonrenewable resources.
9. Give three examples of fossil fuels.
10. When we talk about "alternative energy sources" what are we saying these energy sources are an alternative to?
11. Explain how we can harness wind power.
12. Explain how we can harness solar energy.

Periodic Table:

13. Why are atoms neutral?
14. How are elements arranged on the Periodic Table?
15. What is an atomic number? An atomic mass?
16. What is significant about elements in a group?
17. What are valence electrons? What do valence electrons determine about an atom?
18. What group are the noble gases? Why are they considered inactive?
19. Which two groups are most reactive? Why?

Chemical Bonding & Polymers:

20. What is the difference between a nuclear reaction and a chemical reaction?
21. What is a chemical bond? How is one formed?
22. What is the difference between an ionic bond and a covalent bond? Between what types of elements do each form?
23. What shapes do Carbon compounds form?
24. What are the 5 types of chemical reactions? Give the A, B, C representation for each.
25. What is the difference between alkanes and alkenes?

26. What is a polymer? A monomer?
27. Give two examples of natural polymers and two examples of synthetic polymers.
28. How is the elasticity of a polymer determined?
29. If .5g of H₂ react completely with 16g O₂, what will be the mass of the product H₂O₂?
How do you know?
30. Balance: Mg + Cl → MgCl₂
31. Write a balanced equation for the electrolysis of water.
32. What is an endothermic reaction? What is an exothermic reaction?
33. What can you do to increase the rate of a reaction?

Biogeochemical Cycles & Pollution:

34. What does pH measure about a substance?
35. In terms of what pH measures, what does it mean if a substance is acidic? Basic?
36. What is the pH value of an acid? A base? A neutral substance? Give an example of each.
37. What substance is the universal solvent? Why?
38. What can you do to help a solute dissolve?
39. Draw a picture of the water cycle and explain each part.
40. Explain what happens when fertilizers runoff into ponds. (Include the process and the name of the process.)
41. Explain what happens when pesticides runoff into ponds. (Include the process and the name of the process.)
42. Why can't we use DDT anymore?
43. Sketch the layers of Earth's atmosphere. Where do we live? Where is the ozone layer?
44. Where is ozone beneficial? Where is it harmful? Explain why.
45. What is acid rain? How is it formed?
46. What is photochemical smog? How is it formed?
47. What is carbon monoxide?
48. Explain and diagram the ozone depletion process.
49. Explain and diagram the carbon cycle. When do fossil fuels become part of the carbon cycle?
50. What is released when fossil fuels are incompletely burned? What would be released if fossil fuels were completely burned?
51. What are producers? Consumers? Decomposers?
52. Write the equations for photosynthesis and respiration.
53. Keeping the above question in mind, name one way water vapor gets into the air.
54. How do human activities affect the carbon cycle?
55. Explain and diagram the nitrogen cycle.
56. Where is nitrogen "free"? In what form is it free?
57. Explain the greenhouse effect. How is it beneficial? Harmful?
58. What are greenhouse gases? Give two examples.
59. What is global warming? Name two effects of global warming.
60. Are the greenhouse effect and global warming the same thing? Explain.
61. What does it mean if something is biodegradable?