

Atomic Models Questions

Purpose:

- to extract information from a science reading source
- to trace the historical development of atomic models

Read the reading ***Evolution of the Atomic Concept and the Beginnings of Modern Chemistry*** by M. Fowler (<http://www.phys.virginia.edu/classes/252/atoms.html>)

Answer the following questions with short responses except where asked to explain

1. Name the first 2 atomic “theorists”
2. Describe their basic idea of the atom
3. Give their simple definition of the term *atom*
4. According to these 2 theorists, how did the different physical properties come about?
5. What is the significance, according to Epicurus, about particles seen in a ray of sunlight?
6. What did the Greek philosophers believe about the movement of atoms?
7. Democritus mechanical picture of the universe indicated that all natural phenomenon could be understood in terms of what?
8. What was Aristotle’s role in the *conceptual progress in atomic theory*?
9. Describe Galileo’s mathematical concept of the atom
10. Explain Newton’s concept of bodies acting upon one another
11. According to Newton, how is heat generated?
12. What did Newton *want* to understand and believe about the universe
13. Opinion question....do you think beliefs influence observations?
14. On what was the alchemist’s point of view based?
15. What did Lavoisier realize about combustion?
16. What is the significance of Lavoisier’s used of *closed vessels*?
17. What was Lavoisier’s discovery about weights of materials?
18. What element did Lavoisier discover?
19. What is the origin of the term *guinea pig* to mean an experimental subject?
20. Compare/contrast Boyle’s and Lavoisier’s definitions of the term *element*?
21. What three contributions did Lavoisier make that began the modern study of chemistry?
22. How did Lavoisier die? Why did he die this way?
23. What is Dalton’s definition of the term *atom*?
24. What did he assume about compounds?
25. What is Dalton’s rule of greatest simplicity?
26. What was Dalton’s symbol (chemical formula) for water.
27. How did Dalton determine that water might actually contain 3 atoms?
28. What are the 2 possible outcomes when carbon combines with oxygen to form a gas?
29. What were the results of Guy-Lussac’s investigations about the reactions of hydrogen and oxygen gases?
30. Did Dalton and Guy-Lussac agree? Why or why not?
31. What is Avogadro’s hypothesis?
32. Did Dalton agree with Avogadro? Why or why not?
33. Why is Dalton’s picture of a gas considered a *roadblock* to an understanding of gas reactions?
34. What is the significance of the observations that, when electric currents are passed through water or other substances, different substances appear at the electrodes?
35. How many elements were known in 1800?
36. How many elements were known in 1860?
37. What is a visual term used to define the term *valence*? What is the law of octaves? Did it work?
38. Describe Mendeleev’s periodic chart and why he left gaps. Were his predictions accurate? Why was he upset by the discovery of the noble gases?
39. When was the atom finally accepted?