

Early Atomic Theory Homework

- 1) What's the difference between the Law of Definite Composition and the Law of Multiple Proportions? Explain, and give examples of each.
- 2) Explain why the law of conservation of mass may be difficult to prove in the laboratory.
- 3) The electrolysis of water can be expressed with the following equation:



If water is a liquid and the hydrogen and oxygen formed in this reaction are gases, has the law of conservation of mass been obeyed? If so, how do you explain the fact that we don't usually weigh gases? If not, explain why not.

- 4) Explain why each of the following true statements is either a confirmation or refutation of Dalton's Laws.
- When one form of uranium undergoes neutron bombardment, it explodes to form two different elements (plus lots of energy).
 - One atom of uranium weighs 235 atomic mass units (amu) and another weighs 238 amu.
 - When you put gasoline in your car, the weight of the gasoline is 75 kilograms. When the gasoline has been mostly used up, the weight of the remaining gasoline is 6.5 kilograms.
 - The formula of a known superconducting material is $\text{La}_{1.85}\text{Ba}_{0.15}\text{CuO}_4$.
 - When sodium metal is placed into water, it causes the water to decompose and catch fire. When potassium metal is placed into water, the same thing happens.