HW3

[redacted] – answers

Part 1 – history

1. Democritus – 450 BC
2. The gold foil experiment. 1 in 8000 a particles came back and he concluded that there must me a nucleus.
3. The ~~electron cloud~~ model. Upon observing the spectral lines of hydrogen (the emission spectra) he reasoned that the electrons must be in specific orbitals, corresponding to different energy levels.
4. The Atomic Theory of Matter
   - Everything is composed of atoms and the atom is not divisible
   - Matter is conserved in a chemical reaction. The reaction is a rearrangement of the atoms or molecules
   - Compounds always have the same number and kind of atoms
   - All atoms of a given element are identical
5. Qualitative observations deal with qualities of an object (blue, sweet, heavy) while quantitative observations are numerical (15 grams, 2 cm tall etc.)
6. The different colors seen in the emission spectra of hydrogen correspond to different energy levels for the electron. As the electron returns from an excited state, a photon is emitted with a specific energy corresponding to the energy difference between the two energy states.

Part II

1. both
2. chemical
3. physical
4. chemical
5. physical
6. chemical
7. chemical
8. chemical
9. both
10. physical
11. physical
12. physical
13. physical
14. chemical
15. physical

Part III

1. temperature change
2. color change
3. precipitation (solid formation)
4. gas released
5. light emitted
6. True