Atomic structure: scientists

Atomic structure: scientists 1. Democritus: 1st person to think of atom (500 BCE)- philosopher Atom is the smallest piece of an element that has same properties as the element. 2. Lavisier: Law of conservation of mass/ matter - Mass can't be created or destroy; same amount of stuff 3. Joseph Proust: Law of constant composition (law of definite Proportions) - A compound is always made of the same elements in the same ratio. 4. John Dalton: English school teacher who derived the atomic theory of matter in 1803 same time around the Louisiana purchase) Elements can combine to form mass compound the ratio of one of the elements will be 2/1 and the other elements will be in small whole numbers. Law of multiple proportions. 5. Michael Faraday: Reasoned that the structure of the atom was related to electricity. 6. Ben Franklin: Big Bad Ben -Discovered that lightning was static electricity -Static charges don't move Current electricity- moving electrical charge Ex: outlet & battery -discovered 2 charges positive and negative/ Opposite charges attract like charges repel. 7. J. J Thomson: Cathode ray tube -Discovered and named the electron (e-) 8. Henri Bequerel: discovered that uranium is radioactive Radioactivity = spontaneous emission of radiant E from an element as its nucleus decays. Radioactivity does not come from stable elements. 9. Marrie & Pierre Curie: Discovered 2 radioactive element Po(polonium) and Ra (Radioactive) 10. Ernest Rutherford: British scientist who discovered 3 kinds of radioactivity. Alpha: 2 plus charge & heaviest/ 3 is the slowest Beta: charge very light weight; fast Gamma: no charge (neutral) (no particles) Just lead is dense so the radiation stays Alpha: scattering (gold foil experiment) Discovered the nucleus of the atom He used gold atoms(cause its dense) Ruthefords experiment description: He put a lead box with a emitter inside the box. He aimed the box at a sheet of gold foil.

So the surrounded the set up with florescent screen to if the beams would bounce back instead the particles went straight through the foil. This was the oppioset of what he expected -about 1/8000 of the particles bounced back. The nuclear model is extremely dense It would weigh 250 billion tons 11. Chadwick- discovered the neutron 12. Goldstein- discovered the proton 13. Henry Moseley- found that every element has a unique charge on its nucleus. Atomic #= the number of protons in the nucleus of an atom defining characteristic of an element. A charged particle, formed when an atom (or group of atoms) gains or bases electrons is called an ion Ion (cation): Formed by metals when they lose electrons. (oxidation) Ion (anion): usually formed by non-metals when they gain electrons (reduction) Ex: S12 2plus charge — there are two more positive protons than electrons Isotope: an atom that has the same 3 of p+ (same element) as another atom but a different # of N than that atom. Atomic mass unit (amu) a unit of mass used for atoms, molecules, ions, p+, n, e- isotopes etc C-12 is the standard for atomic masses. Mass of exactly 12 amus Atomic mass unit is 1/12 of the mass of a C-12 atom Ex: M= A+N 12= 6+6 Atomic mass = the average mass, based on the masses of all the isotopes for the element. (the % of each isotope in nature influence the mass of the atoms weighted % average To calculate the average atomic mass of an element 1. Multiply the mass (amu) by the % abudance (frequency) FOR EACH ISOTAOPE 2. Add them up (check answer with periodic table NEVER DIVIDE JJ Thomson Cathode Ray Experiment: -He chose glass because it was rigid. -Two metal pieces: cathode (-) anode (+) -Green ray through middle -Little wheel moves by ray -Only works with power -A bend beam with magnet -Made of energy and particles J. J. Thomson: 2 set of experiments (1) setup a series of test Put a

positively charged plate near Cathode ray tube and the beam went toward plate indicating the ray is (-) Then did experiments by moving plate all around tube, the beam always went toward positive plate (beam was negative) Then changed to negative plate the ray was not attracted. Moved plate around got the same results. He concluded that the beam was negative. Still not satisfied. Placed two negative plates than the ray was repelled making it thin. Then he moved the plates around The he switched to two positive plates ray got thicfed Then meg + pos & moved; the ray Conclude (-) ray was negative & made of negative particles Measured how long each drop takes to fall into chamber two plates top (+) bottom (-) iodizing radiation (charge in drops). Used atomizer to spray oil drops. Sprayed into chamber used iodizing ration to put a charge on drops then on Discovered the electron -Electricity stuff: -Alternating current (AC) -Outlet Direct Current -Battery Voltage is the unit for electric current. Mass composition 1. List the elements ex: H2 = H(2) 2. Find atomic mass in the periodic table 3. Multiply across ex: H2= # x # 4. Add them up Ex: 1. H2 x 1. 01 = 2. 02 2. 1 x 16. 00 = 16. 00 3. 16. 00+2. 02= 18. 02 4. 16. 00/18. 02 x 100 - Next if the prob says % composition or mass % then you must make a % FOR EACH ELEMENAT - Take the mass of each element and divide by the mass of the compound. Calculate the % of CuSo3 Cu: 1 x 63. 54 = 63. 54 S: 1 x 32. 06 = 32. 06 O: 3 x 16 = 48 Add 63. 54+32. 06+48= 143. 6 this is the total mass of all three element Oxygen: 48/143. 6 x 100 = 33. 43% Cu= 32. 06/1436 x 100 = 22. 33% this is the florida 63. 54/143. 6 x 100 = 44. 25%