Chemistry 1A Notes:

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Lecture 1 – Matter

Atoms are the unit of matter from which everything else is built. Atoms themselves are made up of other particles (covered in Lecture 3). There are over 100 identified *species o*f atoms, and are arranged on the periodic tables. Atoms can be bound together to form molecules.

The lowest level of substances is atoms. Only very few species of atoms can exist on their own without binding to other substances.

- These are called the 'noble gases' and are in the last column of the periodic table.
- Unreactive, and exist solely as a single atom
- Gaseous at room temperatures, can be liquid at very, very low temperatures

The next level of substances are elements. Elements are <u>two or more</u> atoms of the <u>same species</u> bound together. They may be molecular or metallic. Everyday examples include hydrogen (H_2), oxygen (O_2), and ozone (O_3). Metals may also be elements, provided only one species of metal is present in the substance.

Molecules may also be compounds, by which there are two or more <u>different</u> atomic species bound together. Molecules vary enormously in size and complexity. Common compounds include water (H_2O), carbon dioxide (CO_2), and glucose ($C_6H_{12}O_6$).

Mixtures contain a number of different atoms, molecules or elements in the same substance. These are not chemically bound together.

These are the Laws of Composition.

Matter can be broken down into four states:

- solid
- liquid
- gas
- plasma

Solids exist when there are strong intermolecular forces (forces between different molecules) holding all molecules close to one another in a static position ie unable to move anywhere.