

Chem 111

Lecture 1

Welcome

- Dr. Joseph.
- Course is closed.
- The class.



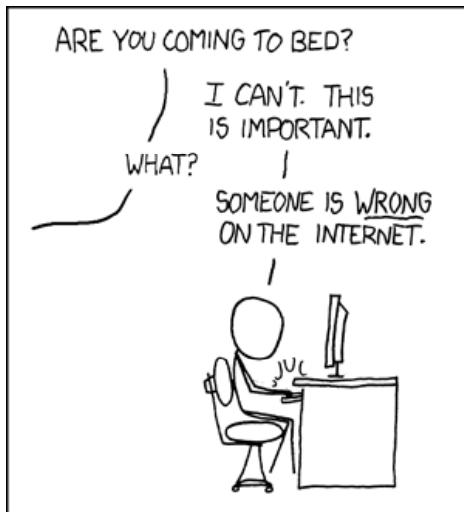
Homework

- Read syllabus
- Read Chapter 1
- OWL online homework due Thursday. **9/09/2010**



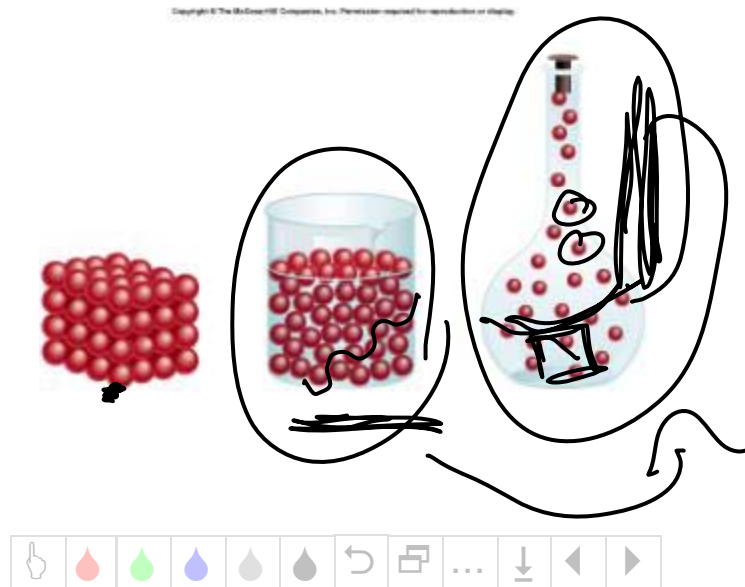
Chapter 1

- **Chemistry** – is the study of the properties of materials and the change that materials go through.
- **Qualitative Analysis** – determination of the presence or absence of a particular characteristic.
- **Quantitative Analysis** – determination of the amount (numerical value) of a particular characteristic.
- **Section 1.1** – Gets a bit philosophical, talks about the goals, dilemmas, integrity of science.

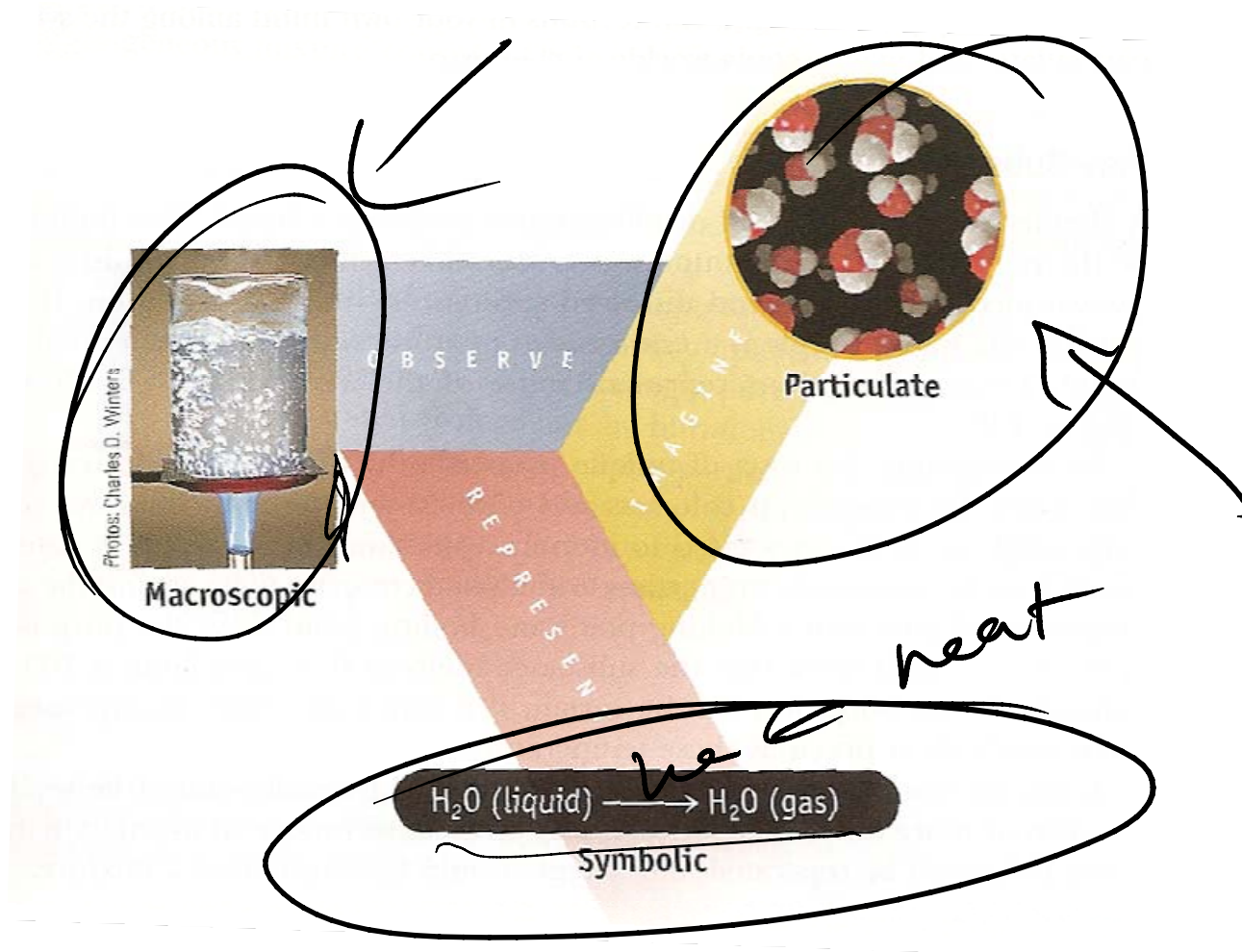


Matter

- **Matter** – is the physical material of the universe.
- **Gas** – no fixed volume nor shape.
- **Liquid** – distinct volume but no shape.
- **Solid** – definite volume and shape.
- **Kinetic-molecular theory of matter** – all matter consists of extremely tiny particles which are in constant motion.



How Chemists View The World



Classification of Matter

Pure substance - matter that has fixed composition and distinct properties.
eg Table Salt, Water, Copper...

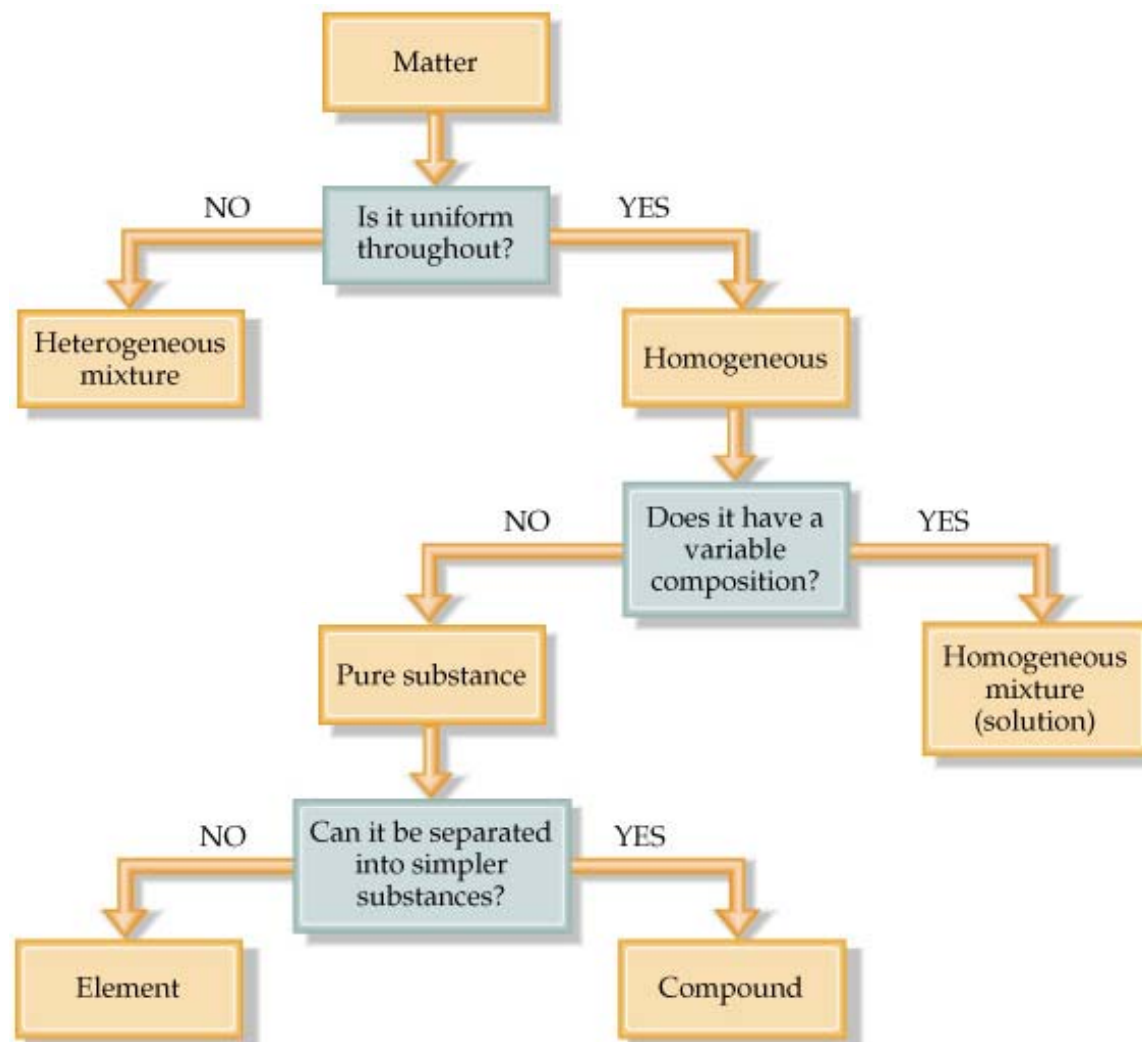
- H • **Elements** – substances that can not be decomposed into a simpler substance. Each element is composed of only one kind of atom.
- H₂O • **Compounds** – are composed of two or more elements, and thus composed of two or more kinds of atoms.

Mixtures – are combinations of two or more substances in which each substance retains its own chemical identity. They have variable composition. *eg air, chocolate chip cookie...*

- **Homogenous mixtures** – mixtures that are uniform throughout, sometime called solutions.
- **Heterogeneous mixtures** - do not have the same properties, composition and appearance throughout the mixture.



Classification of Matter



Properties of Matter

Physical Properties – are properties that we can measure without changing the identity and composition of the substance. eg color, odor, density, melting point, boiling point

$$\text{Density} = \text{mass/volume}$$

Chemical Properties – describe the way the substance may react to form another substance. eg *flammability*



Changes in Matter

Physical changes – a substance changes its physical appearance but not its composition.

Chemical changes – a substance is transformed into a chemically different substance. ****Chemical reactions****

