

# CHEM111

## General Chemistry I

Spring 2022

### Atomic theory

Elements are made up of atoms

Atoms of a given element are "identical" ↓

Same number of protons and electrons

A compound is formed when two or more different elements combine chemically

Chemical reactions cause atoms to rearrange/change the way in which they are bonded together

# Atomic Structure

## Element

Atoms- retain properties of the element

Protons- relative charge +1  
mass  $1.67 \times 10^{-27} \text{ kg}$

Neutrons- relative charge 0  
mass  $1.67 \times 10^{-27} \text{ kg}$

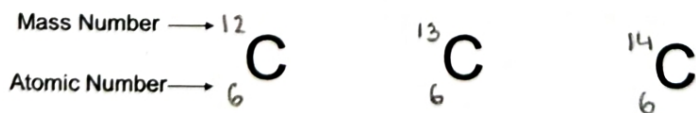
Electrons- relative charge -1  
mass  $9.11 \times 10^{-31} \text{ kg}$

Atomic number (Z) = number of protons

Mass number (A) = protons + neutrons

Isotope: Atoms of same element with different masses (different # of neutrons)

Common isotopes of carbon



# Ions

An atom that has lost or gained an electron(s) or a group of atoms that has a net positive or negative charge.

Symbol <sup>Charge</sup>	or Formula <sup>Charge</sup>
$\text{Na}^+$	$\text{NH}_4^+$
$\text{Cu}^+, \text{Cu}^{2+}$	$\text{SO}_4^{2-}$
$\text{Cl}^-$	$\text{SO}_3^{2-}$
	$\text{PO}_4^{3-}$