

### Problem Set 4: The Atom

- 1) How many neutrons, protons, and electrons do the following isotopes have, what element is represented by each chemical symbol?
  - a)  ${}^3_2\text{He}$
  - b)  ${}^{13}_6\text{C}$
  - c)  ${}^{40}_{19}\text{K}$
  - d)  ${}^{204}_{80}\text{Hg}$
  - e)  ${}^{235}_{92}\text{U}$
  - f)  ${}^{117}_{78}\text{Pt}$
- 2) A sample of chlorine is 75.77% by mass of the Cl-35 isotope and 24.23% by mass of the Cl-37 isotope what is the relative atomic mass of chlorine?
- 3) Calculate the number of moles and atoms in the following samples?
  - a) 5.0 g of carbon
  - b) 2.5 g lead
  - c) 150 g of hydrogen
- 4) How many grams are in 0.500 moles of the following elements?
  - a) Magnesium
  - b) Phosphorous
  - c) Sulfur
- 5) List the likely ionic charge on the following main group elements.