Exam I – Skills List

1. Given an ionic bond with energetics of the form

   $$E_N = -\frac{A}{r} + \frac{B}{r^n},$$

   and values for A, n, and r_0, calculate the theoretical elastic modulus for the material.

2. Given a crystal structure (FCC, BCC, or SC), either R or a, and the indices of a direction in that crystal structure, calculate the linear packing density in atoms/length in that direction.

3. Given some combination of amount and type of initiator, amount and type of monomer, number-averaged degree of polymerization, or number-averaged molecular weight, determine the missing quantity or quantities for a free-radical-chain-addition polymer.

4. Given the composition of a three component alloy in weight percent, determine the composition in atomic percent, OR, given the composition of a three component alloy in atomic percent, determine the composition in weight percent.