

INS 2006/07, Week 6, Winter Quarter
Chemistry Homework Problems to Practice Born-Haber Cycles

1. Use the following information to calculate the lattice energy of CaCl_2 . Then draw a Born-Haber cycle to show the relevant information.
 - Energy needed to vaporize calcium (solid) = 192 kJ/mol
 - 1st ionization energy of calcium = 589.5 kJ/mol
 - 2nd ionization energy of calcium = 1146 kJ/mol
 - Electron affinity of chlorine = -348 kJ/mol
 - Bond energy of chlorine gas = 242.6 kJ/mol
 - Energy of formation of calcium chloride = -795 kJ/mol

2. Use the following information to calculate the electron affinity of bromine. Then draw a Born-Haber cycle to show the relevant information.
 - Energy of formation of sodium bromide = -360 kJ/mol
 - Energy needed to vaporize bromine (liquid) = 31 kJ/mol
 - 1st ionization energy of sodium = 495.4 kJ/mol
 - Bond energy of bromine gas = 192 kJ/mol
 - Lattice energy of NaBr = -743.3 kJ/mol
 - Energy needed to vaporize sodium (solid) = 107.8 kJ/mol