## HW \#7: Interactions - Part II

## 1. - The Pair Potential:

Why is a typical interatomic potential, such as in Hofmann Fig. 2.1, so asymmetric?

## 2. - Bonding:

a) Where does the energy gained in metallic bonding come from?
b) Remind yourself of the $\infty$-lattice Madelung constant. Calculate the potential energy for an ion in a sodium chloride crystal (which has an interatomic distance, $a$, of $2.81 \AA$ ), in units of eV . Neglect the influence of the repulsive potential. - From this, calculate the lattice energy of sodium chloride and compare the result to the experimental value of $776 \mathrm{~kJ} \mathrm{~mol}^{-1}$. Also calculate the cohesive energy in the same units.

