

# Chapter 11

A crystalline solid consists of a large number of atoms arranged in a regular array.

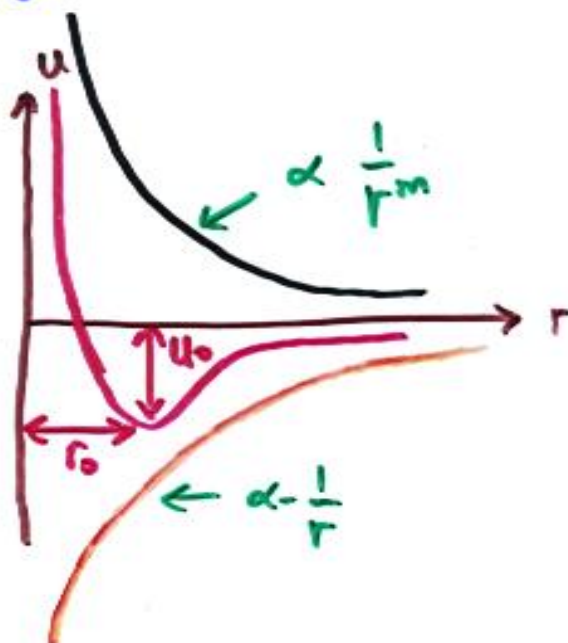
Bonding mechanisms in solids are:

ionic solids such as NaCl crystal. The total potential energy per ion pair is:

$$U = -\alpha \frac{k e^2}{r} + \frac{B}{r^m}$$

$\alpha$  attraction term repulsion term

$\alpha$ : Madelung Constant



at  $r=r_0$ :  $U \rightarrow U_0 = -\alpha \frac{k e^2}{r_0} \left(1 - \frac{1}{m}\right)$