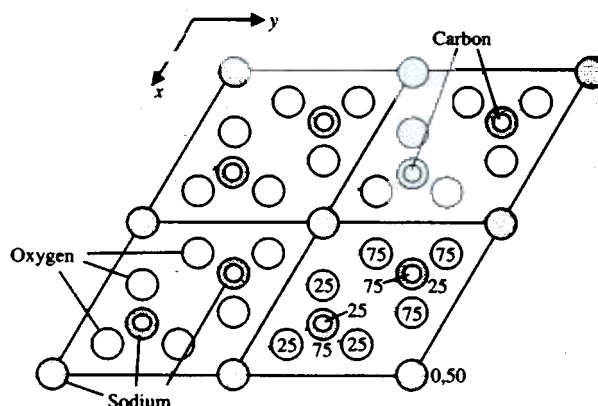Physics 601: Solid State Physics I

Physics 601: Solid State Physics I
Problem Set #4, due Monday, October 4, 2004

Problem 1: (from Dove, Chapter 3)

(3.10) The figure below shows the **hexagonal** crystal structure of Na_2CO_3.

Identify the point symmetry of the sites occupied by the different atoms. (*Hint*: identify all point symmetry operations of the crystal systematically, and deduce the point symmetry of the atoms as arising from the symmetry elements that intersect each atom.)

Problem 2: (adapted from Dove, Chapter 6)

List the systematic absences for the following orthorhombic space groups. (To make this problem a little easier, I attach the list of generators and general positions for each of the space groups. The complete list for all 230 space groups can be found on the useful web site http://www.cryst.ehu.es)

(a) Pcca; (b) Pmmn; (c) Pnn2; (d) $Pmn2_1$.

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