

1.5. TRANSFORMATIONS OF COORDINATE SYSTEMS

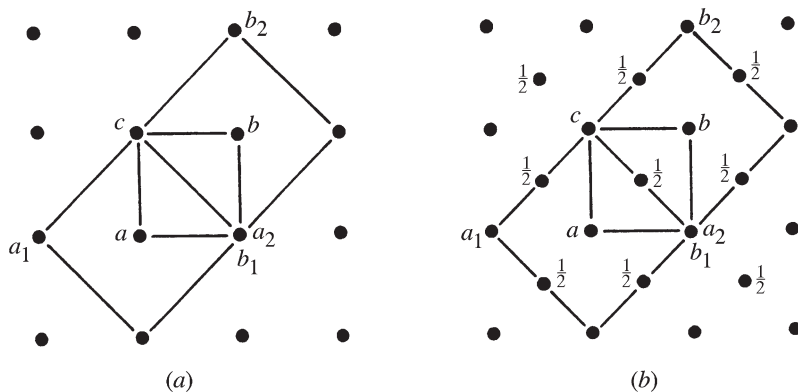


Figure 1.5.1.5
Tetragonal lattices, projected along $[00\bar{1}]$. (a) Primitive cell P with a , b , c and the C -centred cells C_1 with a_1 , b_1 , c and C_2 with a_2 , b_2 , c . The origin for all three cells is the same. (b) Body-centred cell I with a , b , c and the F -centred cells F_1 with a_1 , b_1 , c and F_2 with a_2 , b_2 , c . The origin for all three cells is the same. The fractions $\frac{1}{2}$ indicate the height of the lattice points along the axis of projection.

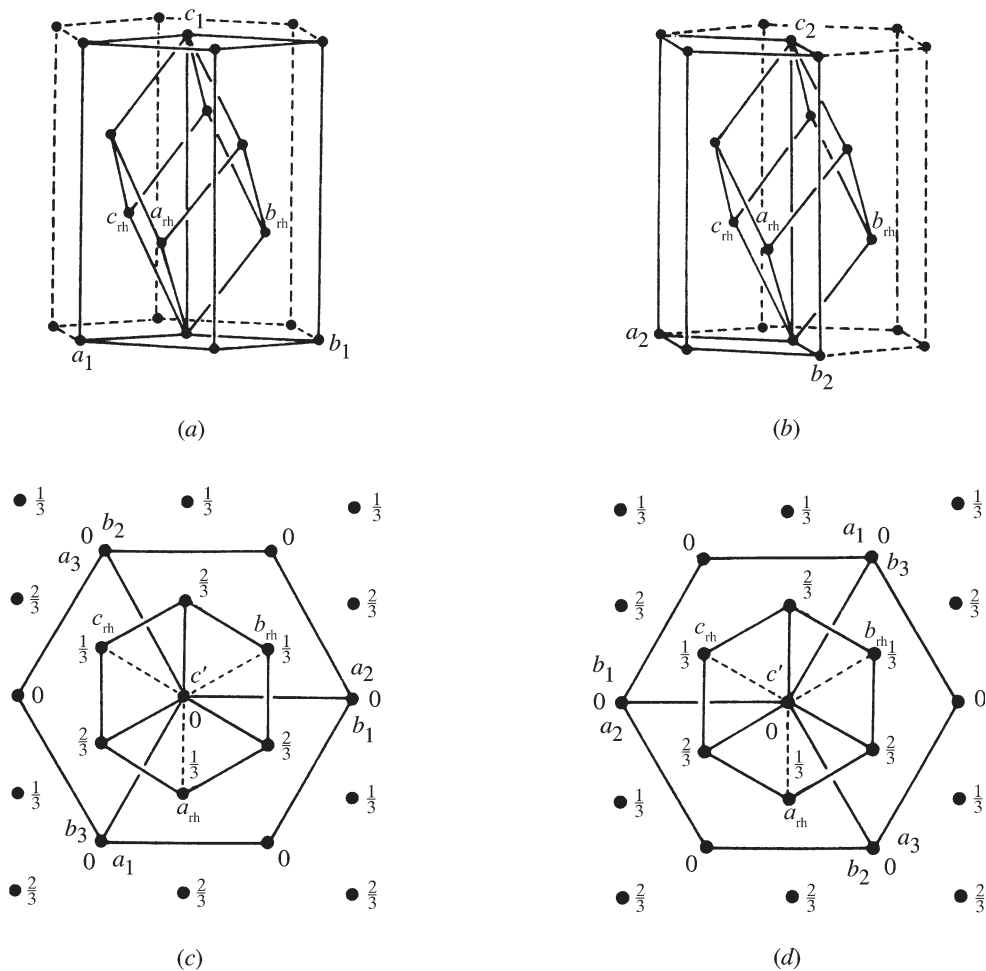


Figure 1.5.1.6
Unit cells in the rhombohedral lattice: same origin for all cells. The basis of the rhombohedral cell is labelled a_{rh} , b_{rh} , c_{rh} . Two settings of the triple hexagonal cell are possible with respect to a primitive rhombohedral cell: The *obverse setting* with the lattice points $0, 0, 0; \frac{2}{3}, \frac{1}{3}, \frac{1}{3}; \frac{1}{3}, \frac{2}{3}, \frac{2}{3}$ has been used in *International Tables* since 1952. Its general reflection condition is $-h + k + l = 3n$. The *reverse setting* with lattice points $0, 0, 0; \frac{1}{3}, \frac{2}{3}, \frac{1}{3}; \frac{2}{3}, \frac{1}{3}, \frac{2}{3}$ was used in the 1935 edition. Its general reflection condition is $h - k + l = 3n$. The fractions indicate the height of the lattice points along the axis of projection. (a) Obverse setting of triple hexagonal cell a_1 , b_1 , c_1 in relation to the primitive rhombohedral cell a_{rh} , b_{rh} , c_{rh} . (b) Reverse setting of triple hexagonal cell a_2 , b_2 , c_2 in relation to the primitive rhombohedral cell a_{rh} , b_{rh} , c_{rh} . (c) Primitive rhombohedral cell (--- lower edges), a_{rh} , b_{rh} , c_{rh} in relation to the three triple hexagonal cells in obverse setting a_1 , b_1 , c_1 ; a_2 , b_2 , c_2 ; a_3 , b_3 , c_3 . Projection along c' . (d) Primitive rhombohedral cell (--- lower edges), a_{rh} , b_{rh} , c_{rh} in relation to the three triple hexagonal cells in reverse setting a_1 , b_1 , c_1 ; a_2 , b_2 , c_2 ; a_3 , b_3 , c_3 . Projection along c' .