

The first and second layers can be in positions labelled A and B while the third layer can be placed above the C positions. The pattern continues as ABCABC..., the pattern repeating at every third layer.

A stacking fault* in such an fcc structure occurs if this sequence gets disturbed, as in ABCBCABC.... Here a layer A is missing, while in the sequence ABCABACABC... an extra A layer has been introduced. While stacking faults can, at least in principle, extend through the entire crystal, they usually occupy only a part of the plane. In this last case, of a stacking fault which terminates within the crystal, the configuration at the termination is referred to as a partial dislocation.

1.6. *Glissile and Sessile Dislocations*

Dislocations that can move by pure slip are called glissile. Dislocations which cannot glide, but have to move by some form of mass transport are called sessile (Read, 1953).

In crystals, the dislocation core spreads to certain crystallographic planes containing the dislocation line. If the core spreads into one of such planes, the core is planar and is glissile. If the core spreads into several non-parallel planes of the zone of the dislocation line, it is non-planar and is sessile. In the former case the dislocation moves easily in the plane of the core spreading, while in the latter case, it moves only with difficulty (Vitek, 1992). A Shockley partial is a partial dislocation, the Burgers vector of which lies in the plane of the fault. Then, Shockley partials are glissile. A Frank partial is a partial dislocation, the Burgers vector of which is not parallel to the fault. Then, Frank partials are sessile.

1.7. *Concept of Fractals*

Over a decade or more, diverse scientists have recognized that many of the structures common in their experiments have a quite special kind of geometrical complexity. The pioneering work was that of Mandelbrot (1977, 1979, 1982, 1988) who drew attention to the particular geometrical properties of such things as the shore of continents, tree branches, or the surface of clouds.

*Stacking faults remain a challenge for interatomic force fields. A novel system which might test N-body force laws discussed in Chapter 8 has arisen from the study of S. A. de Vries *et al.*, (Phys. Rev. Lett. *81*, 381, 1998). These authors have studied the influence of Sb on the formation of stacking faults due to Ag(111) growth using X-ray scattering (see also related theoretical studies of S. Oppo *et al.*, Phys. Rev. Lett. *71*, 2437, 1993).