

(a)



Fig. 3.3 (a) A three-dimensional cluster of spheres generated by shaking at $\epsilon = 0.05$. (b) The corresponding contact network to the cluster in (a). Small balls represent the centres of the spheres, while bonds represent the contacts between them. The centres of spheres B, C, D and E in contact with the central sphere A have been coloured red. (c) The contact network after cluster (a) is further shaken with $\epsilon = 0.05$; notice the similar topology to (b). (d) The contact network after cluster (a) is shaken with $\epsilon = 0.5$; notice the completely changed topology of this network relative to (b).





near-crystalline ordering.

Fig. 3.13 An example of typical clusters obtained after 2000 timesteps.



Fig. 4.1 A five particle *complex bridge*, with six base particles (left), and the corresponding contact network (right). Thus n = 5 and $n_b = 6 < 5 + 2$.



Fig. 4.2 A seven particle *linear bridge* with nine base particles (left), and the corresponding contact network (right). Thus n = 7 and $n_b = 9 = 7 + 2$.



Fig. 4.3 Definition of the angle Θ and the base extension *b* of a bridge. The main axis makes an angle Θ with the *z*-axis; the base extension *b* is the projection of the radius of gyration of the bridge on the *x*-*y* plane.