(a) Homogeneous nucleation

(b) Heterogeneous nucleation

FIGURE 9-28. The double nucleation mechanism for deoxyHbS gelation: (a) The initial aggregation of HbS molecules (circles) occurs very slowly because this process is thermodynamically unfavorable and hence the intermediates tend to decompose rather than grow. However, once an aggregate reaches a certain size, the critical nucleus, its further growth becomes thermodynamically favorable, leading to rapid fiber formation. (b) Each fiber, in turn, can nucleate the growth of other fibers, leading to the explosive appearance of polymer. [After Ferrone, F.A., Hofrichter, J., and Eaton, W.A., J. Mol. Biol. 183, 614 (1985).]