

Chapter 3 Supplemental Problems

1. Given the following expression for the free energy of formation for a nucleating, spherical particle, derive the expression for the activation free energy barrier for nucleation, ΔG^* , in terms of ΔG_v and γ , both of which can be assumed to be independent of particle radius.

$$\Delta G = \left(\frac{4\pi r^3}{3} \right) \Delta G_v + 4\pi r^2 \gamma$$

Answers

1. $\Delta G^* = (16\pi\gamma^3)/(3\Delta G_v)$

Review Questions

1. What role does surface energy play in homogeneous nucleation of a condensed phase?
2. How can one arrive at values of surface energy from nucleating experiments?
3. What are nucleating agents?