$$B = 215 \exp\left(-\frac{0.70 \text{ eV}}{kT}\right) = (215) \exp\left[-\frac{0.70 \text{ eV}}{(8.62 \times 10^{-5} \text{ eV/atom-K})(1000 + 273 \text{ K})}\right]$$

$$= 0.365 \ \mu\text{m}^2/\text{h}$$

And computation of the time *t* from the rearranged form of Equation 18.37, leads to

$$t = \frac{x^2}{B} = \frac{(0.100 \ \mu\text{m})^2}{0.365 \ \mu\text{m}^2/\text{h}}$$

$$= 0.0274 \text{ h} = 98.6 \text{ s}$$

And at 700°C, the value of *B* is

$$B = (215) \exp\left[-\frac{0.70 \text{ eV}}{(8.62 \times 10^{-5} \text{ eV/atom-K})(700 + 273 \text{ K})}\right] = 0.0510 \ \mu\text{m}^2/\text{h}$$

Whereas the time required to grow the 100 nm oxide layer is

$$t = \frac{x^2}{B} = \frac{(0.100 \ \mu\text{m})^2}{0.0510 \ \mu\text{m}^2/\text{h}}$$

$$= 0.196 \text{ h} = 706 \text{ s}$$

From the above computations, it is very apparent (1) that the 100 nm oxide layer forms more rapidly at 1000°C (than at 700°C) in both O_2 and H_2O gaseous atmospheres, and (2) that the oxide layer formation is more rapid in water vapor than in oxygen.