Table 2.9 Cyclic Versus Constant 25°C Data. $k_{25} = 0.01\%$ Per Day

E, kCal per mole	Loss after 3 years	Percent increase in loss
10	11.16	1.9
15	11.38	3.9
20	11.77	7.5
25	12.27	12.1
30	12.89	17.7

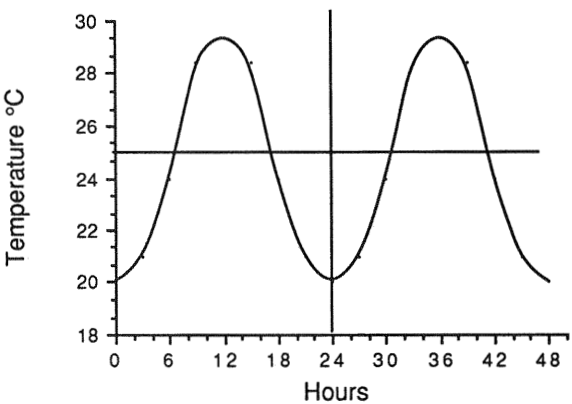

Fig. 14 Daily temperature fluctuations according to Eq. (2.54).

It is noted that any type of cycle can be used, e.g. seasonal cycles could be used as well. The problem of cyclic testing (for chemical stability) is raised from time to time. But to decide on a cycle is difficult, and it is much more rational to use the data from accelerated studies to produce the desired profile.

7.2. Nonisothermal Kinetics

It is possible, rather than studying a reaction at a fixed temperature (isothermally), to vary the temperature in a given fashion, and fit the data to Eq. (2.50).

For a zero-order reaction we can write

$$\frac{C_0}{C} = kt = \left[Z \exp\left(-\frac{E_a}{RT} \right) \right] \cdot t \tag{2.58}$$

We may allow T to vary in a given manner, e.g., in the simplest case as

$$\frac{1}{T} = a - bt \tag{2.59}$$

where a and b are the constants that we input into a programmable temperature