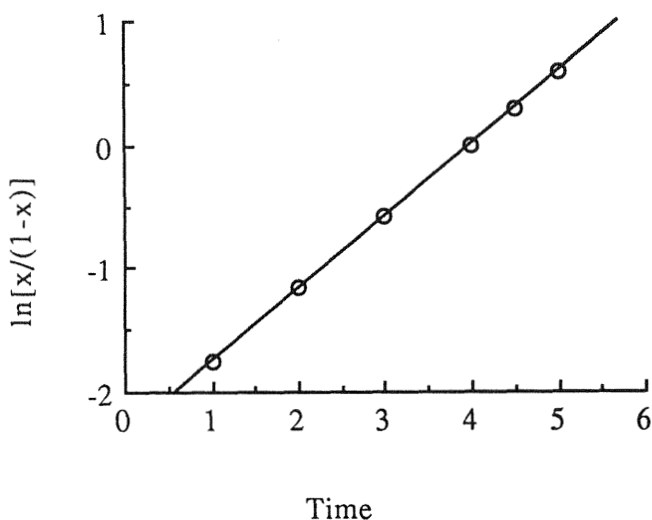


Table 2 Prout-Tompkins Data at 55.6°C

Time	0	1	2	3	4	4.5	5
Gas (mmoles)	0	0.48	0.86	1.56	2.77	3.71	4.96

Table 3 Data in Table 4.2 Treated According to Eq. (6.13)

Time	0	1	2	3	4	4.5	5
Gas (mmoles)	0	0.48	0.86	1.56	2.77	3.71	4.96
x	0	0.087	0.155	0.28	0.50	0.668	0.893
$\ln[x/(1-x)]$		-1.75	-1.17	-0.58	0	0.291	0.581

**Fig. 3** Data from Table 2 plotted according to Eq. (6.13). The least squares fit is $\ln[x/(1-x)] = -2.334 + 0.5832t$ with an R value of 1.00.

This type of reaction embodies the dehydration of solid hydrates. Leung et al. (1998a,b) have shown that aspartame 2.5 hydrate cyclizes by Prout-Tompkins kinetics and that the rate constants follow an Arrhenius equation.

3. TEMPERATURE DEPENDENCE OF THE SOLID TO SOLID + GAS REACTION

The rate determining parameter in Eqs. (6.12) and (6.13) is a . In general, activation energies encountered in pharmaceutical systems are between 15 and 30 kCal/mole. However, the parameter a is a stoichiastic parameter and is not necessarily of this order of magnitude. Figure 4 shows the data from Table 3 extended to several temperatures. The least squares equation for the Arrhenius plot is

$$\ln[a] = 83.553 - 28.42 \frac{1000}{T} \quad (6.15)$$