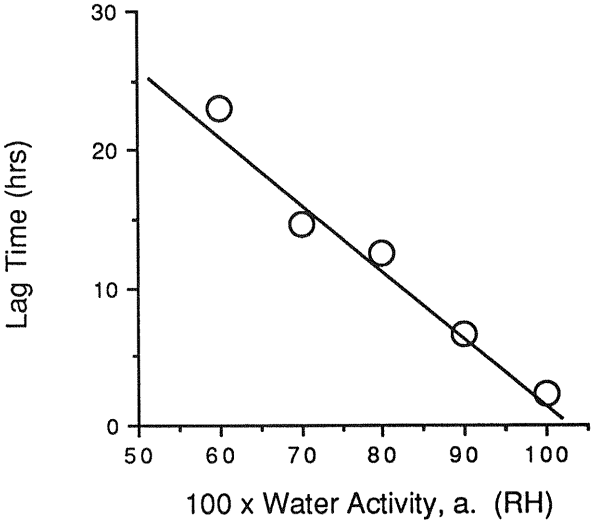

Fig. 3 Lag times from Fig. 2 plotted versus relative humidity. (Graph constructed from data published by Morris, 1990.)

in the drug (Carstensen, 1977) and they also showed that the mechanism changed at this point. At values higher than the CRH the degradation consists of (a) dissolution up to where dissolution is complete, after which (b) moisture condensation will continue until a concentration of the totally dissolved drug equals that of the RH of the atmosphere.

Koizumi et al. (1997) showed that the dependence of water concentration on the rate constant of decomposition of Lornoxicam tablets is log-log related to the log of the moisture content.

Carstensen et al. (1965) had shown this to be correct for vitamin A beadlets as well.

$$\frac{d[\mathrm{A}]}{dt} = -k[\mathrm{A}][\mathrm{H_2O}]^n \tag{7.10}$$

4. THE LEESON–MATTOCKS MODEL

This is the most frequently applicable model and it assumes that sorbed moisture forms a layer about the particles. It corresponds to situation D in Fig. 1. One might argue that such a layer (a so-called bulk sorbed moisture layer) could not be created until the moisture content is high enough, so that the RH of the atmosphere surrounding solid equals or is in excess of the RH of a saturated solution of the drug. One might then conclude that the Leeson–Mattocks model only holds at RH values in excess of the critical relative humidity (CRH). However *rather than that being true it holds below the CRH*. For a certain range of RH values less than the CRH, the Leeson–Mattocks model applies, and degradations are pseudo zero order. Phenobarbital when it decomposes at 80°C in the presence of phosphate buffer at pH 6.7 is an example of a case where, in the initial stages of decomposition, this