It is to be expected that the weight of the anhydrate will not increase until the relative humidity of the salt pair is reached. If one only considers the part ABC, then this is logical.

It is noted that the abscissa is time as well as relative humidity, since this latter is changed as a function of time. The curve often goes beyond the weight of the anhydrate, and it is hypothesized that what actually happens is that the relative humidity at which the increase occurs is that of the saturated solution of the anhydrate. This is a metastable solution and will start precipitating out in time (point C) until the weight levels off at the theoretical weight of the hydrate. On the "down" curve, this hydrate then remains until the relative humidity of the salt pair is reached, and then it drops off.

So, if an experiment is carried out as shown in Fig. 30, it is not certain that the relative humidity at A is the equilibrium relative humidity of the hydrate/anhydrate salt pair, because as in a conventional isotherm, the "water channel" could act in the same fashion as a pore, and the "breakthrough" vacuum might be an indication of the effect of the Kelvin equation.

Only a few unreported studies have been carried out of this kind (Pudipeddi, 1995; Dali, 1995; Shlyankevich, 1995), but the method, in the sense of the preceding paragraph, could be of importance in assessing diameters of water channels and of interfacial tension between water and the organic and inorganic matrix molecule (via the Kelvin equation).

17. PHOTOLYSIS IN THE SOLID STATE

Not much systematic work has been reported on photolysis of solids. Lachman et al. (1961) pointed out that, most often, a solid tablet will decompose by photolytic decomposition only in the surface area, so that if one broke a "discolored," exposed tablet the color would be unaffected in the interior.

However, Kaminski et al. (1979) reported on a case where a combination of moisture and light caused an interaction between a dye and a drug that permeated the entire tablet.

Tønnesen et al. (1997) have reported on the photoreactivity of mefloquine hydrochloride in the solid state.

REFERENCES

Adler, M., Lee, G. (1999). J. Pharm. Sci. 88:199.
Agbada, C. O., York, P. (1994). Int. J. Pharm. 106:33.
Anderson, N. R., Banker, G. S., Peck, G. E. (1982). J. Pharm. Soc. 71:7.
Avrami, M. (1939). J. Chem. Phys. 7:1103.
Bawn, C. (1955). "Chemistry of the Solid State," p. 254, Academic Press, New York.
Bray, M. L., Jahansouz, H., Kaufman, M. J. (1999). Pharm. Devl. Techn. 4:81.
Byrn, S. R. (1982). Solid State Chemistry of Drugs. New York: Academic Press, pp. 59–70.
Carstensen, J. T., Kothari, R. (1983). J. Pharm. Sci. 72:1149.
Carstensen, J. T., Morris, T. (1993). J. Pharm. Sci. 82:657.
Carstensen, J. T., Musa M. N. (1972). J. Pharm. Sci. 61:273, 1112.
Carstensen, J. T., Pothisiri, P. (1975). J. Pharm. Sci. 64:37.
Carstensen, J. T., VanScoik, K. (1990). Pharm. Res. 7:1278.
Carstensen, J. T., Aron, E., Spera, D., Vance, J. J. (1966). J. Pharm. Sci. 55:561.