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A discussion of the paper "THE KINETICS OF HYDRATION OF CALCIUM SULPHATE HEMIHYDRATE: A CRITICAL COMPARISON OF THE MODELS IN THE LITERATURE" by R.J. Hand*

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Hand has used Avrami's equation to generate 'theoretical hydration curves' for calcium sulphate hemihydrate, and then has used 'data' derived from them to test equations due to Ridge (1,2) and Schiller (3). But Avrami's equation has no established validity in the field and is, in fact, irrelevant. To test the two equations, experimental determinations of the progress of hydration at constant temperature are required.

Such data has been obtained for the accelerated and unmodified reactions by the Highett group (2,4,5). Plot of $F(\alpha)$ (see refs 2 and 5) against time were linear when acceleration was produced by increased nucleation (powdered gypsum added). The plots moved upward with little change in slope. When neutral salts were added, the plots converged to a point, with varying slopes. The isothermal data did not accord with Schiller's equation.

The Highett group has also shown that if the reaction is carried out adiabatically and the increase in temperature used to follow its progress, the values of the constants k and C in Ridge's equation were closely similar to those from isothermal data, thus providing a valuable practical means of studying the reactivity of calcined gypsum (6).

References

1. M.J. Ridge, *Aust. J. Appl. Sci.* **10** (1959) 218.
2. M.J. Ridge, *Nature* **204** (1964) 70.
3. K. Schiller, *J. Appl. Chem.* **12** (1962) 135.
4. M.J. Ridge and H. Surkevicius, *J. Appl. Chem.* **12** (1962) 246.
5. M. Goto and M.J. Ridge, *Aust. J. Chem.* **18** (1965) 769.
6. M.J. Ridge and J. Beretka, *Rev. Pure Appl. Chem. (Australia)*, **19** (1969) 17.

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