



Discussion

A discussion of the paper “Delayed ettringite formation in heat-cured Portland cement mortars” by R. Yang, C.D. Lawrence, C.J. Lynsdale and J.H. Sharp[☆]

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With much interest, I read this very interesting paper. By using mainly quartz sand, the authors have covered a lot of ground. However, I have a couple of questions about their results and maybe on their interpretations. I hope the authors will be kind enough to comment on my questions.

Fig. 2 of their paper shows that in the room-temperature-cured mortars, ettringite content was 5% on the 2nd day then dropped to 4% on the 5th day and thereafter increased slowly to about 7% by 19th day. This increase in ettringite content had happened even though significant amount of monosulphate appeared in those mortars by the 7th day as can be seen from Fig. 3. Furthermore, Fig. 3 of the paper shows that monosulphate content increased steadily at least up to 180 days. The observed increase in ettringite content in room-temperature-cured mortars between 5 and 19 days, in spite of increasing monosulphate formation, indicates a delayed release of sulphate ions from an unidentified source. This source of sulphate ions is of such character

that it could overcompensate the effect of increasing monosulphate formation. Have the authors any idea about the nature of this delayed releasing source of sulphate ions?

My second question is the relation between delayed ettringite formation and expansion. Fig. 3 of the paper shows that in the room-temperature-cured mortars, ettringite reappeared between 180 days and 1 year. This means that delayed ettringite formation is not invariably tied with heat curing of the mortars; it happens also in room-temperature-cured samples. The authors should be congratulated for the removal of this confusion. Fig. 3 shows that in 1-year-old samples, the amount of this delayed formed ettringite is higher in room-temperature-cured mortars than in mortars cured at 100°C. If delayed ettringite formation is the cause of delayed expansion in mortars cured at 100°C, then why did the room-temperature-cured mortars not expand? Have the authors any idea?

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