



DISCUSSION

**A REPLY TO THE DISCUSSION OF THE PAPER “HYDRATION OF
ORDINARY PORTLAND CEMENTS MADE FROM RAW MIX CONTAINING
TRANSITION ELEMENT OXIDES” BY F.P. GLASSER¹**

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The impurities of cement raw mix are preferably dissolved in the liquid phase but, as alite is formed and crystallised from the melt, a considerable amount of foreign ions enters the silicate structure. As it is suggested by Hornain and Tsuboi, although the aluminoferrite phase contains a higher percentage of ZnO than the other clinker phases, the greatest part of ZnO is consumed by alite (1,2). Our investigation on pure C_3S doped by ZnO confirms the change of alite structure from triclinic to trigonal, as has already been mentioned by other authors (2). Modifications in the alite XRD pattern are also found.

As far as the solubility limit of ZnO in the clinker minerals is concerned, it must be noted that further modifications of colour, free lime consumption rate, and cooling reactions appear as the addition of ZnO rises to 1.5% w/w in the raw mix. M. Murat and F. Sorrentino have also reported that large amount of Zn can be absorbed in clinker (3). Of course the considerable volatility of ZnO at high temperatures must be taken into account, but a solubility limit of 0.2% seems to be too low.

There is no doubt that the incorporation of minor elements in clinker and their effect on raw mix sintering and cement hydration processes is a complex physicochemical phenomenon. The authors believe that the role of minor elements in clinkering can be evaluated by the measurement of selected clinker properties and their correlation with certain physicochemical parameters of these ions (4,5). The paper under discussion belongs to a series of experiments aiming to the above target. More results concerning the relation between cement properties and element nature will be soon published.

References

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