The analysis of a large set of samples by means of several different methods — petrography, optical microscopy, IR- and Raman spectroscopy, porosimetry. DSC — is very common in practice of material science. After carrying out all the experiments, the groups of researchers obtain a wealth of raw data. The required final result, though, in most cases is to answer several — or even one — question concerning the state of the construction. Obviously, the transition from empirical information to the final decision can be done by means of non formal operations, for example expert appraisal. However, even for most intelligent experts it is quite difficult to perform such an evaluation. In order to condense the raw experimental data we propose simple and formal procedure. The offered method consists of several steps. The first step is to arrange data in such a way, that the rectangular matrix (of size M by N, where M and N are the number of samples and methods, respectively) is formed. This matrix can be called matrix of defectiveness. Then, for all pairs of columns of the mentioned matrix, we compute the Pearson’s product-moment (correlation) coefficient; the result is the symmetric N by N matrix of accordance of methods. By means of summation over the rows of the later matrix we obtain information concerning the mutual correspondence of the methods — vector of significance (third step). And finally, at the fourth step, we compute the M scalar products of vector of significance and row of the matrix of defectiveness. The M obtained values are subject to further application by the descriptive statistics, and on the basis of this statistics the final decision can be made. The offered method was successfully applied in the practical task of identification of alcali-silica reaction.

Key words: cement composites, alkali-silica reaction, correlation analysys.

References

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