PERFORMANCES EVALUATION OF PORTLAND CEMENT PRODUCED FROM DOPED CLINKERS

Jenica Paceagiu1, Georgeta Voicu2

1SC CEPROCIIM SA, Bd. Precizei nr. 6, sector 6, CP 062232, Bucharest, Romania
2University Politehnica of Bucharest, Faculty of Applied Chemistry and Materials Science, Polizu Str. no.1-7, Bucharest, Romania

Abstract

This study aims to obtain high performance cement under friendly environmental conditions, through the optimization of clinkerization process. The influence exerted by mineralizers i.e. fluoride (NaF, KF) or oxide (CuO, TiO2) on the Portland clinker characteristics and derived cement properties is presented in this experimental study. The presence of these additions in low concentration (i.e. 0.5-0.8 wt. %) permits the reduction of the burning temperature (with 20°C up to 70°C) of raw mix and modifies clinker phases morphology, grindability and reactivity. The cements obtained by doped clinkers intergrinding with 5% gypsum can be classified as 42.5N/R or 52.5N while the reference cement belongs to 42.5N strength class according to EN 197-1. Other cement properties i.e. water for standard consistency, setting time, soundness and hydration heat were also assessed. A brief analysis regarding the benefits of cement obtained from doped clinker as compared with reference clinker was also done.

Key words: environmental protection, mineralizers, Portland cement

Received: August, 2013; Revised final: February 2014; Accepted: March, 2014

* Author to whom all correspondence should be addressed: e-mail: jenica.paceagiu@ceprocim.ro; Phone. +4021 3188894; Fax. +4021 3188893