Available online at www.sciencedirect.com

ScienceDirect

Procedia Engineering 165 (2016) 1112 – 1117

Procedia Engineering

www.elsevier.com/locate/procedia

15th International scientific conference "Underground Urbanisation as a Prerequisite for Sustainable Development"

Efficiency of use of galvanic sludge in cement systems

Sergei Stepanov [a], Nikolai Morozov [a,b,*], Nina Morozova [a], Damir Ayupov [a], Dmitry Makarov [a], Daniil Baishev [a]

[a]*Kazan state university of architecture and engineering, Zelenaya str. 1, Kazan, 420043, Russia*
[b]*Kazan Federal University - Naberezhnye Chelny Institute, Russia*

Abstract

The use of waste products as accelerators of cement systems' hardening is economically justified in case of their high efficiency. In this work it was shown that use of galvanic sludge which contains mainly oxides and hydroxides of aluminum, allows to accelerate processes of cement hydration and decrease setting time and increase the speed of strengthening. The best results of strength were obtained by joint usage of galvanic sludge and superplasticizers, because of its water-reducing effect in cement systems.

Peer-review under responsibility of the scientific committee of the 15th International scientific conference "Underground Urbanisation as a Prerequisite for Sustainable Development

Keywords: superplasticizers, hardened cement paste, galvanic sludge.

1. Introduction

In last decades growth of physical and mechanical properties of concretes is connected with forthcoming of new chemical and mineral admixtures. Inclusion of them allows not only to improve strength of concrete, but also to decrease permeability, thus increasing its lifetime [1-6]. One of the modern directions of modifying admixtures' improvement is development of concrete hardening and curing accelerators. There is significant effect of its usage takes place in technology of prefabricated concrete and reinforced concrete. Decrease of cement setting time and

* Corresponding author. Tel.: +7-903-314-4226.
E-mail address: nikola_535@mail.ru

Peer-review under responsibility of the scientific committee of the 15th International scientific conference "Underground Urbanisation as a Prerequisite for Sustainable Development
doi:10.1016/j.proeng.2016.11.827