

<https://doi.org/10.7250/CONNECT.2025.078>

HARDENING AND RESISTANCE OF MAGNESIA BINDERS OF VARIOUS COMPOSITIONS

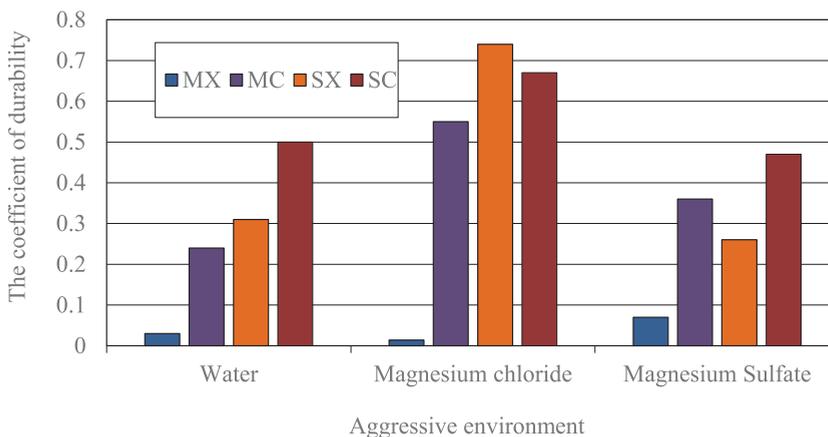
Olga MIRYUK*

Rudny Industrial University, 111500, Rudny, Kostanay Region, Kazakhstan

* **Corresponding author.** Email address: psm58@mail.ru

Abstract – An analysis of the scientific and technical literature of recent decades indicates an increasing interest in magnesia materials. There are convincing facts about the advantages of caustic magnesite and materials based on it. Magnesia materials are characterized by low energy consumption, intense hardening, high strength and adhesion to various surfaces. There is a known positive experience of using magnesia binders to produce concrete of dense and porous structure. Currently, the unique properties of magnesia materials are not fully exploited for the following reasons: limited amounts of natural magnesite deposits, low water resistance of hardened magnesia stone. The purpose of the work is to study the effect of mineral additives and salt sealants on the hardening and resistance of binders in aggressive aqueous environments. The experiments used raw materials: caustic magnesite, metallurgical slag, ash from thermal power plants, and iron-containing man-made waste. Solutions of magnesium chloride, magnesium sulfate, iron sulfate and their combinations were used to seal magnesia binders. The composition of magnesia materials was investigated using diffractometric analysis. The properties of the materials are determined by methods of physico-mechanical tests. The results of strength tests of magnesia binders located in various media: air, water and salt solutions are presented. The strength indicators are complemented by photographs of the appearance of the samples exposed to corrosive influences. The reasons for the change in the resistance of binders in aggressive liquids are substantiated. Preferred compositions of magnesia binders that exhibit increased resistance to corrosion processes are proposed. The research results are aimed at developing resource-saving technologies and increasing the durability of efficient building materials.

Keywords – *Caustic magnesite; combined binders; corrosion; strength.*



The coefficient of resistance of binders after 21 days of testing in aggressive environments