

Microstructural characterization of plastering mortars with CRT glass addition

Abstract

Due to the lead content, the cathode ray tubes (CRTs) glass waste are considered a great environmental risk, as the lead ions from broken CRT glass can leach into soils when in contact with waters from landfills. Currently, the recycling techniques used for CRT glass are limited due to the different compositions of the panel, funnel and neck of the kinescope tube, however, an alternative would be their recycling in binding materials. Accordingly, the paper aims to obtain secondary raw materials that can be used in the building materials sector by using a mixture of CRT glass waste (neck and panel). The plaster mortars were obtained by replacing the sand with CRT glass (its fraction being lower than 0.31mm) in different proportions-10%, 20% and 30%. The specimens were mechanically tested after 1, 2 and 7 days of hardening. The compression strengths of the obtained plaster mortars were relatively similar to the reference sample. The specimens were characterized by scanning electron microscopy (SEM) coupled with energy dispersive X-ray spectroscopy (EDS) and the results revealed a porous structure, with frequent micro-cracks. The micrographs highlighted the presence of calcium hydrosilicates and hydroaluminates, ettringite, calcium hydroxide, calcite and some unreacted particles.