Elastomeric influence of rural rubber latex on cement mortar at high temperatures using thermal degradation analysis

Abstract

The importance of thermal endurance in relation to finishes prone to elevated temperatures cannot be over emphasized. Inclusion of elastomeric substances into mortar aimed at improving performance properties may therefore pose a serious threat. This paper presents experimental findings regarding elastomeric influence of natural rubber latex (NRL) – a typical elastomer – on cement mortar. Hardened cement paste, NRL-films, cement–latex blends, control and modified mortars containing 10% and 20% latex/water ratios were prepared and cured for 6 months. Microstructural units of samples were observed through SEM followed by subjection to TGA within a temperature range; 25–900°C. The results indicate that NRL degrades to about 5% (by weight) at temperatures between 350 and 430°C. Eventually, NRL-modified mortar was significantly affected by the softening of NRL-films present in the co-matrix. However, the overall resistance of the modified systems to thermal degradation was surprisingly improved by the inclusion of the elastomer.