CHARACTERISTICS OF CEMENT SUPERPLASTICIZER BASED ON POLYMELAMINE SULPHONATE

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Superplasticizers (SPs) are effective organic additives for reducing water content, giving homogeneity and non-segregation, lowering porosity, increasing mechanical strength and workability, and achieving sufficient fluidity and good plasticity of cement [1–3]. SPs possibly decompose into relatively small molecular weight polymers over the long term, and these organic substances may be leached into groundwater from cementitious materials.

According to the market analysts, the sulfonated melamine formaldehyde (PMS) condensates segment held a 31% share of the overall market, which is highest among other types of concrete SPs [4].

Detailed chemical composition of the cement superplasticizer Peramin ® SMF10 based on PMS has been done by Wavelength dispersive X-Ray Fluorescence (WD-XRF) spectroscopic method. The above analysis has shown that the product contains 99.824% of the polymer. Additionally, minor amounts of P_2O_5, ZnO, Na_2O, SiO_2, CaO, Cl^-, Al_2O_3, and Fe_2O_3 have been determined.

Other physicochemical properties of the superplasticizer were evaluated by thermo-gravimetric analysis at a range of 30 – 800 °C. The polymer is stable thermally up to 270 °C.

In order to investigate the rate of alkaline degradation of the SP in different aqueous solutions, spectroscopic analyses (Raman and UV/Vis) have been applied.

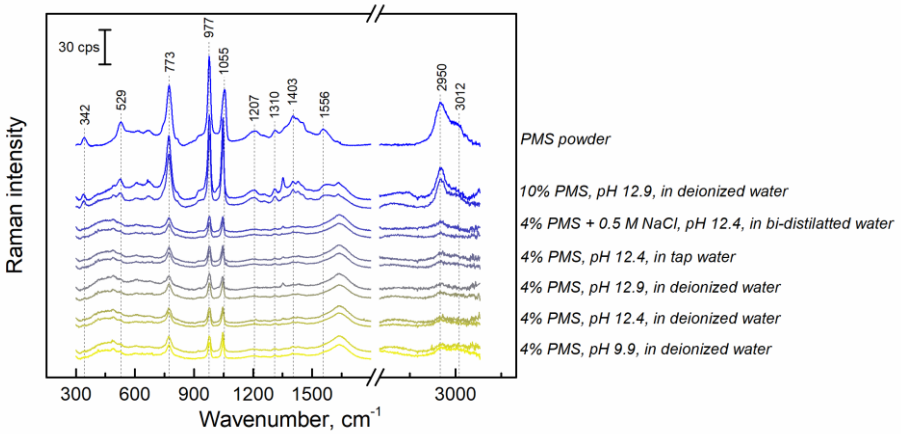

Fig. 1. Raman spectra of different PMS hydrolytic solutions during the time. The upper curves indicate solutions after 3 months, the lower ones –just made samples.

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