Chromium retention properties of N-alkyl quaternized poly(4-vinylpyridine)

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The ability of solid N-alkyl quaternized poly(4-vinylpyridine) with hexyl, octyl and decyl bromide for the retention of chromate and dichromate forms of Cr(VI) in aqueous solutions is studied. The retention of Cr(VI) was investigated by batch equilibrium procedure and this study was supported by UV-vis spectrophotometry, infrared (IR) spectroscopy and thermal analysis (glass transition temperature and thermal degradation). The retention of Cr(VI) was possible in the range of concentrations between 1 × 10-6 and 1 × 10-3 mol/L and it was dependent on the length of the polyelectrolyte side aliphatic chain. Thermogravimetric analysis (TGA) indicated that solid phase, (N-alkyl quaternized poly(4-vinylpyridine), with Cr(VI) (P4VPyC8-Cr(VI)) is slightly more stable than P4VPyC8 in absence of Cr(VI). Differential scanning calorimetric (DSC) measurements indicate that the segmental movements are restricted due to the presence of chromate and/or dichromate ions in the solid phase. © 2008 Elsevie