Physico-chemical properties of green hydraulic fracturing fluids for European shale gas extraction

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The thermal and rheological behaviour of three different polysaccharide aqueous dispersions (guar gum, sodium alginate and sodium hyaluronate) were investigated in order to evaluate their performance as viscosity-modifiers for water-based, green fracturing fluid formulations [1]. Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA) and viscosity measurements were performed in the presence of different salts and co-solutes (NaF, NaCl, NaBr, NaI, Na_2SO_4, NaSCN, $NaClO_4$, Na_3PO_4, Na_2HPO_4, NaH_2PO_4, KCl, trehalose and urea). According to our results, the salt nature and concentration effectively modify the response of these systems in terms of viscosity and thermal behaviour.

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[1] Barati, R. and Liang, J.-T., J. Appl. Polym. Sci., 2014, **131**, 40735.