**Concentration- and shear-dependent ageing phenomena in Sodium Carboxymethyl Cellulose (Na CMC) solutions**

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Sodium Carboxymethyl Cellulose (Na CMC) is the most widely used cellulose derivative. It is used in many different industrial applications including food product formulation. Na CMC is a linear negatively charged water-soluble polymer. Its behaviour in water is known to be very complex and a function of several parameters including the characteristics of the polymer itself such as molecular weight and degree of substitution, as well as solution concentration and dissolution conditions (e.g. addition order of the system components). Physical ageing of Na CMC solutions has been reported in a few previous research studies, although a thorough understanding of time-dependent solution changes is still lacking. Typically, a more or less significant decrease with time in the low-shear viscosity is usually observed even though increases in the viscosity over time have also been reported for some systems. To more completely understand these phenomena, we have investigated the rheological behaviour of a 0.2% and a 1.5% Na CMC solutions (Mw = 700,000 g/mol; DS = 0.9) over long time periods. The least concentrated solution show a decrease in the viscosity over time, which is consistent with reports in the literature. However, the most concentrated solution shows a significant increase in the viscosity as well as a change in the shape of the viscosity curve (i.e. viscosity versus shear rate or shear stress). Additional measurements involving solution stirring the day before the rheology measurements and changes in storage conditions have been conducted to obtain a greater insight into these interesting results.