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Aqueous Viscosity: AI057 Poly(N-isopropylacrylamide)-N-hydroxysuccinimide endcap

The PolyVivo product AI057 is a thermogelling polymer based on a low molecular weight version of Poly(N-isopropylacrylamide) (P(NIPAM)). In this polymer the molecular weight is controlled using Reversible addition-fragmentation chain-transfer controlled by 2-(Dodecylthiocarbonothioylthio)-2-methylpropionic acid. Post polymerization reaction, the carboxylic acid endcap is activated into the N-hydroxysuccinimide ester to provide for conjugation reactions with amines.

One question that remains is what is the effect of this molecular weight control on the over all solution viscosity at cold temperature. Because the P(NIPAM)'s short length the viscosity should be of a lower value relative to high molecular weight P(NIPAM). In order to determine handle-ability at sub-transition temperature, the P(NIPAM) viscosity was measured at 25°C.

Method

PolyVivo AI057 (Lot#: 31120JSG) was dissolved 10% w/v in distilled water overnight in cold, shaking environment. Subsequently the solution was filtered through a 0.45um PVDF syringe filter to remove any particulates. Portions of this solution was the sequentially diluted to generate 2% w/v and 1% w/v AI057 solutions respectively. The viscosity of each solution was tested using a Cannon mini-viscometer (C286) in a 25C water bath and the results are shown below.

Results

PolyVivo AI057 (w/v %)	Solution Viscosity (cSt) (25°C, water)
1% w/v	1.26
2% w/v	1.58
10% w/v	12