Synopsis of Original Research Paper

Development of novel cosmetic materials with on skin gelling properties of thermo- responsible intelligent polymers

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Pluronic F127 (PLF-127) is a high molecular weight poly (oxyethylene) /poly (oxypropylene) / poly (oxyethylene) triblock copolymer, aqueous solutions of which form thermally reversible gels on warming to body temperature. When xyloglucan derived from tamarind seed is partially degraded by β-galactosidase、the resultant product (GXG-TG) exhibits thermally reversible gelation in dilute aqueous solution. The gelation behaviour is similar to that observed with Pluronic F127, with a sol-gel transition on warming from refrigerator temperature. We previously reported the potential use of these thermo- responsible intelligent polymers for drug delivery systems. We now compared the potential of Pluronic F127 and xyloglucan gels as cosmetic materials. Chilled aqueous solutions of PLF-127 and GXG-TG formed gels at concentrations of 20-30%w/w and 1-2%w/w when warmed to 37˚C, respectively. The xyloglucan sol had higher viscosity than the Pluronic sol. Stress-strain plots of the xyloglucan gels were typical of those for elastic gels, but the Pluronic showed different rheological behaviour to that of the xyloglucan gel. All of the Pluronic and xyloglucan sols formed gels at gelation temperratures decreasing over the range 21.5 to 10.2˚C and 27.0 to 22.0˚C with increasing concentration, respectively. The difference in gelling properties of sols was attributed to differences in the structure of the gels. The xyloglucan has recognized non-toxicity and higher moisture content in rat skin compared to that of the Pluronic. These results suggest that novel liquid cosmetic materials with on skin gelling properties can be developed by thermo-responsible intelligent polymers.