CLAIMS

1. A material comprising a multi-block thermogelling polymer, said multi-block thermogelling polymer comprising ~~a hydrophilic polymer block~~poly(ethylene glycol) (PEG); ~~a thermosensitive polymer block~~poly(propylene glycol) (PPG); and ~~a hydrophobic polymer block~~poly(caprolactone) (PCL),

wherein the ~~hydrophilic polymer block~~PEG, the ~~thermosensitive polymer block~~PPG and the ~~hydrophobic polymer block~~PCL are chemically coupled together by at least ~~one of~~a urethane/carbamate~~, carbonate, ester~~ linkage~~s or combinations thereof~~,

wherein the PCL is derived from PCL-diol,

and wherein the material is suitable for use as a vitreous substitute.

~~2. The material of claim 1, wherein the hydrophilic polymer block and the thermosensitive polymer block each comprises a poly(alkylene glycol).~~

~~3. The material of claim 2, wherein the poly(alkylene glycol) of the hydrophilic polymer block is different from the poly(alkylene glycol) of the thermosensitive polymer block.~~

~~4. The material of any one of the preceding claims, wherein the hydrophilic polymer block comprises poly(ethylene glycol) and the thermosensitive polymer block comprises poly(propylene glycol).~~

~~5. The material of any one of the preceding claims, wherein the hydrophobic polymer block comprises a polyester.~~

~~6. The material of any one of the preceding claims, wherein the hydrophobic polymer block comprises a poly(caprolactone).~~

~~7.~~2. The material of ~~any one of the preceding~~ claim~~s~~ 1, wherein the molar ratio of ~~the hydrophilic polymer block~~PEG to ~~the thermosensitive polymer block~~PPG is in the range of 1:1 to 10:1.

3. The material of claim 2, wherein the molar ratio of PEG to PPG is in a range of 2:1 to 6:1.

4. The material of claim 3, wherein the molar ratio of PEG to PPG is 4:1.

~~8.~~5. The material of any one of the preceding claims, wherein the ~~hydrophobic polymer block~~PCL is in an amount of from 1 wt% to 10 wt% of the multi-block thermogelling polymer.

~~9.~~6. The material of any one of the preceding claims, wherein the material comprises 1% to 30% w/v of the multi-block thermogelling polymer in an aqueous medium.

~~10.~~7. The material of any one of the preceding claims, wherein the material has a high water content of more than 60% by weight.

~~11.~~8. The material of any one of the preceding claims, wherein the material has a pH value in a range of from 7.1 to 7.7.

~~12.~~9. The material of any one of the preceding claims, wherein the material is in a flowable state at a temperature falling in the range of 20°C to 30°C and is in a non-flowable gel-like state at a temperature falling in the range of 36°C to 40°C.

~~13.~~10. The material of any one of the preceding claims, wherein the material is substantially transparent.

~~14.~~11. The material of any one of the preceding claims, wherein the material has a refractive index falling in the range of from 1.20 to 1.48.

~~15.~~12. The material of any one of the preceding claims, wherein the ~~bio~~material is substantially devoid of a metal.

~~16.~~13. A method of preparing a material of any one of claims 1 to ~~15~~12, the method comprising:

coupling one or more ~~hydrophilic polymer~~PEG, one or more ~~thermosensitive polymer~~PPG and one or more ~~hydrophobic polymer~~PCL together such that the ~~hydrophilic polymer block~~PEG, the ~~thermosensitive polymer block~~PPG and the ~~hydrophobic polymer block~~PCL are chemically coupled together by at least ~~one of~~ a urethane/carbamate~~, carbonate, ester~~ linkage~~s or combinations thereof~~ to form a multi-block polymer,

wherein the PCL is derived from PCL-diol.

~~17.~~14. The method according to claim ~~16~~13, wherein the one or more ~~hydrophilic blocks~~PEG, one or more ~~thermosensitive blocks~~PPG and one or more ~~hydrophobic blocks~~PCL are mixed in a molar ratio of 1-10: 1: 0.01-1.5.

~~18.~~15. The method according to claim ~~17~~14, wherein the mixing step is performed at an elevated temperature in the range of from 70°C to 150°C.

~~19.~~16. The method according to any one of claims ~~17-18~~14-15, wherein the mixing step is carried out for at least 12 hours.

~~20.~~17. The method according to any one of claims ~~16-19~~13-16, wherein the coupling step is carried out in the presence of a coupling agent and the coupling agent comprises an isocyanate monomer that contains at least two isocyanate functional groups.

~~21.~~18. The method according to claim ~~20~~17, wherein the coupling agent is a diisocyanate selected from the group consisting of hexamethylene diisocyanate, tetramethylene diisocyanate, cyclohexane diisocyanate, tetramethylxylene diisocyanate, dodecylene diisocyanate, tolylene 2,4-diisocyanate and tolylene 2,6-diisocyanate.

~~22.~~19. The method according to any one of claims ~~16-21~~13-18, wherein the coupling step is carried out in the presence of an anhydrous solvent selected from the group consisting of toluene, benzene and xylene.

~~23.~~20. The method according to any one of claims ~~16-22~~13-19, wherein the coupling step is carried out in the presence of a tin catalyst selected from the group consisting of alkyltin compounds, aryltin compounds and dialkyltin diesters.

~~24.~~21. The method according to any one of claims ~~16-23~~13-20, the method further comprises

removing the multi-block polymer of contaminants; and

solubilizing the multi-block polymer in aqueous medium to form a multi-block thermogelling polymer.

~~25.~~22. A synthetic vitreous humour or part thereof comprising the material of any one of claims 1 to ~~15~~12.