(ii) reacting the gelatin with a crosslinker to form a crosslinked gelatin microgel, and

(iii) removing the crosslinked alginate.

[0009] Advantageously, the gelatin microgels obtained with this method in which the initial alginate template is later removed show a better mechanical stability than the previously known alginate systems.

[0010] It has further been found that 4-arm PEG succinimidyl glutarate (pentaerytheritol core) can be used as chemical crosslinker for the gelatin microgel. It is non-cytotoxic and has soft segments in PEG backbone. The use of this crosslinker allows for a moderate crosslinking degree, appropriate gelling time, sufficient mechanical strength, and less solid stress induced by cell growth in the crosslinked microgel. These features are for instance beneficial to microgel fabrication and cell encapsulation.

[0011] Further advantageously, this method for making gelatin microgels is easier and more environmental friendly than the previously known water-in-oil emulsion technique, because it allows avoiding the use of organic solvents (oil) and surfactants during the preparation of the microgel.

[0012] According to the present disclosure, a method has been found wherein step (i) is performed by air-driven droplet generation. Preferably, a mixture comprising alginate, gelatin and 4-arm PEG succinimidyl glutarate (pentaerytheritol core) is used in the droplet generation. More preferably the mixture may additionally contain cells or bioactive molecules.

[0013] Advantageously this new crosslinking way resulted in gelatin microgels with especially enhanced mechanical stability.

[0014] According to the present disclosure, a method wherein the microgel core is additionally coated with alternate layers

after step (ii) of the above mentioned process has been developed. Such alternate layer can be obtained preferably by coating with at least one polycation and at least one polyanion.

[0015] Advantageously, such permeable membrane coated microgel is a suitable cell carrier for cell encapsulation which allows for the cells to maintain over 80 % of their viability for 9 days.

[0016] According to the present disclosure, a microgel with a biodegradable and biocompatible core being coated by alternating layers has been obtained according to the disclosure.

[0016a] According to the second aspect, there is provided a microgel with a chemically cross-linked gelatin core being coated by alternating layers, wherein the gelatin was chemically crosslinked with 4-arm PEG succinimidyl glutarate (pentaerytheritol core) and wherein the alternating layers are composed of at least one polycation and at least one polynion.

[0017] Advantageously, the microgel shows a high mechanical stability and is suited for the encapsulation of cells, tissue and bioactive molecules.

Definitions

[0018] The following words and terms used herein shall have the meaning indicated:

[0019] The term 'microgel' is to be interpreted broadly to include all types of gels with small particle size.

[0020] The word "substantially" does not exclude "completely" e.g. a composition which is "substantially free" from Y may be completely free from Y. Where necessary, the word "substantially" may be omitted from the definition of the invention.

[0021] Unless specified otherwise, the terms "comprising" and "comprise", and grammatical variants thereof, are intended to represent "open" or "inclusive" language such that they include recited elements but also permit inclusion of additional, unrecited elements.