

suitable for covering of wounds on body surface, because they were sufficiently pliable at temperatures around 37° C. Sterilization of these products was performed by the radiation technique (the dose of gamma radiation from Co⁶⁰ was 2.2 Mrad). The material may be additionally combined with aqueous solutions of medicines, because the porosity of material enables their free permeation in spite of the reduced hydrophilicity of synthetic matrix. This covering mean is a sufficient barrier for outside bacteria and has therefore suitable properties for the application in external therapy.

EXAMPLE 7

A similar result as in Example 6 was attained with the copolymer containing 75 wt. % of 2-hydroxyethyl methacrylate and 25 wt. % of 2-ethoxyethyl methacrylate units, which was marked by some higher hydrophilicity, while about the same elastic properties in dry state were maintained.

EXAMPLE 8

The starting copolymer, prepared according to Example 6, was dissolved in 6 M aqueous solution of urea at the ambient temperature (18°-23° C.) to a viscous solution containing 10 wt. % of copolymer solids. The dispersion of collagen (10 wt. parts) in 6 M urea containing 3 wt. % of solids was mixed with the above solution under cooling to 4° C. and the resulting fluid was extruded through a circular nozzle into the coagulation bath consisting of the 20 wt. % aqueous solution of ammonium sulfate. The formed tube of composite of inner diameter 26 mm and outer diameter 30 mm was slid in a tubular poly(ethylene terephthalate) knit-work of diameter 32 mm, thoroughly extracted from ballast materials, radiation sterilized by a Co⁶⁰ source (the dose 2.2 Mrad), and used as an experimental prosthesis of esophagus in a dog.

EXAMPLE 9

According to the procedure described in Example 6, the dispersion of collagen was prepared in 6 M aqueous guanidinium chloride. The dispersion was extruded at low temperature (4°-10° C.) through a flat nozzle into a

coagulation bath (water with 0.5 wt. % of aqueous ammonia added, 7° C.) and the formed fibrillar layer of swollen composite was washed by flowing cold water, dried at ambient temperature and a pressure 1.3 kPa, cut in pieces 10×10 cm, welded in a wrapping of polyethylene foil, and sterilized by a Co⁶⁰ source with the dose 2.2 Mrad. This composite material served as a carrier of medicines additionally applied by swelling of the coat in the solution of medicine (in this case in a mixture of chloramphenicol and colimycine 1000/80) and for covering a burn wound which was infected at wounding by environmental microorganisms. The additional dosage of the solution of medicine is possible directly through the temporary covering of composite material.

We claim:

1. A method for the preparation of a composite polymeric material for biological and medical applications, wherein fibrillar collagen is dispersed in a solution or a high-swollen dispersion of the synthetic hydrophilic polymer or copolymer in a lyotropic agent selected from the group comprising carboxylic acids diluted with water, strongly acidified aqueous mixtures of ethanol and methanol, high-concentrated aqueous solutions of lyotropic salts, and high-concentrated aqueous solutions of urea or guanidinium chloride, under stirring at temperature not exceeding 37° C. and then the lyotropic agent is removed from the viscous dispersion at temperature not exceeding 37° C.

2. The method according to claim 1, wherein a cross-linking agent selected from the group comprising trimethylolurea, formaldehyde, acetaldehyde, glutaraldehyde, starch dialdehyde, glyoxal, and chromium(III) salts, is added, during the preparation of dispersion or after the lyotropic agent has been removed, in the amount of 2.5 weight percent at utmost, related to the total amount of the synthetic polymer or copolymer and collagen.

3. The method according to claim 2, wherein a biologically active compound, and if it is desired, a filler and/or a plasticizer are added during the preparation of dispersion or after the lyotropic agent has been removed.

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