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Hydrophilic/hydrophobic nanocomposition for wound care and method of its manufacturing and use

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Healing of infected ulcers and wounds, particularly in older people, is a serious problem in modern surgery. Hydrophilic/hydrophobic composition Pathelen® which contains nanosized silica (Aerosil 300), hydrophobic silica (Aerosil R972 Pharma) and benzalkonium chloride serves as an effective mean for the topical treatment of wounds. Pathelen® belongs to a group of application sorbents. Changing the ratio of hydrophilic/hydrophobic silica, one can use this composition in different stages of wound process dependently on the intensity of exudation. The aim of the study was the development of optimal pathway for laboratory manufacturing and quality control of this drug. The manufacturing process of Pathelen® consists of immobilization of benzalkonium chloride on the surface of hydrophobic silica by the treatment in a ball mill and mixing of obtained semi-product with nanosized silica in the mixer. The quality control of preparation includes the IR spectroscopy examination, chemical methods of identification, purity tests, study the adsorption power relatively to gelatin and control of microbial contamination. Particularly, it was shown the absence of pathogenic microorganisms and fungi, the quantity of non-pathogenic microorganisms complies to requirements of European Pharmacopoeia to the products of this category. The obtained results may be useful for the organization of the factory production of proposed preparation.

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