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Optimization of the composition of solid dispersion of quercetin

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Introduction: Increasing the solubility of drugs is one of the most important problems in pharmacy, because, most manufactured pharmaceutical substances are sparingly soluble. Typically, such compounds represent Classes II and IV in the biopharmaceutical classification system, which is based on the classification of pharmaceutical substances by solubility and permeability. For poorly soluble substances, the limiting step of the absorption process is usually the degree and dissolution rate, so in the pharmaceutical development, much attention is paid to their improvement. To solve this problem, the technology of solid dispersions creation is used. The aim of the work was to optimize the composition of quercetin solid dispersion, whose therapeutic use is limited due to its degree of solubility in an aqueous medium.
Materials and methods: Objects of the study were samples of solid dispersions of quercetin with different carriers: polyethyleneoxide-6000, β- cyclodextrin, polyvinylpyrrolidone obtained in a ratio of 1: 1 and 1: 2 by liquid phase method with and without the addition of a solvent. As a solvent ethanol 96 % was used. The powder of solid dispersion of quercetin and model tablets based on it were analyzed. To determine the optimal composition of solid dispersions, the mathematical planning method was used using the least squares method (OLS), the MathCad package and the Excel program.
Results: According to the results of experimental studies, a dispersion analysis was performed. The ranked series of advantages of the carrier and a solvent influence on solubility of solid dispersions samples are shown. To determine the amount of carrier in the solid dispersion, the theory of multi-vector optimization was used. According to the results of the conducted studies, the optimal value of quercetin and PEO-6000 ratio - 1: 2.
Conclusions: The obtained results can be used in the development of the composition and technology of solid dispersions of active pharmaceutical ingredients insoluble in the aqueous medium.

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