

## FORMULATION OF CREAM CONTAINING IBUPROFEN 5%

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### ABSTRACT

**Background:** Non-steroidal anti-inflammatory drug (NSAID) is a group of drugs commonly used to treat musculoskeletal diseases. However, according to statistics, up to 25% of long-term NSAID users had peptic ulcer disease, and 2-4% had gastrointestinal bleeding or perforation. Therefore, it is necessary to study preparations for external use to minimize these undesirable effects. **Objectives:** The cream containing ibuprofen 5% has been formulated with good physical characteristics and high bioavailability in the in vitro test based on the support of design and optimization software. **Methods:** According to the D-Optimal model, the formula models of cream containing ibuprofen 5% were designed with the different concentrations of oil phase, water phase, and emulsifier. The formulas of medicinal cream were prepared by direct emulsification method, then evaluated and compared to the criteria consisting of the phase separation, spreadability, and release of the active ingredient through cellulose nitrate membrane with a 0.45  $\mu\text{m}$  pore size. **Results:** The formulation of the cream containing ibuprofen 5% with various components consisting of ibuprofen (5 g), cetyl alcohol (3.85 g), stearyl alcohol (1.54 g), beeswax (3.85 g), paraffin oil (10.77 g), span 80 (11.70 g), sodium lauryl sulfate (3.30 g), propylene glycol (59.90 g), and nipagin M (0.10 g). The results also showed that the product had good physical characteristics with no separation between the oil and the water phases, a spread area of 618  $\text{mm}^2$ , and the release of the active ingredient through the cellulose nitrate membrane at 0.209 mg/mL. **Conclusion:** The cream containing ibuprofen 5% was researched based on excipients of oil and water, making an emulsion structure stable and helping meet the foundational criteria according to the medicinal cream regulations.

**Keywords:** cream, ibuprofen, spreadability, diffusion through the membrane.