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Abstract

Cyclodextrine Based Nanogels and Phase Solubility Studies of Flurbiprofen as a Chemopreventive Agent †

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Abstract: Flurbiprofen (FB) is one of the nonsteroidal anti-inflammatory drugs (NSAIDs) which has low water solubility (1). In recent studies it is shown that NSAIDs tend to demonstrate chemopreventive activity and chemoprotective agents frequently show low water solubility (2). In this study FB was selected as a model drug. Cyclodextrins (CDs) which are natural products and have special structure (hydrophobic inner phase and hydrophilic outer phase), have been widely used to enhance solubility and stability of drug substances (3). The objective of this study was to prepare CD based nanogels for increasing solubility and stability of FB. Nanogels were prepared with two different ratio (0.02 and 20%) and type of CD (βCD and HPβCD) using emulsification-solvent evaporation technique. Particle size (PS), polydispersity index (PDI), zeta potential (ZP) were investigated and phase solubility studies were performed to optimize CD based nanogels. According to results of phase solubility studies; it was achieved to enhance water solubility of FB with HPβCD 56.7 fold. PS, PDI and ZP were found as 154.5 ± 3.1 nm, 0.25 ± 0.01, −60 ± 2 mV for 0.02% HPβCD and 270.7 ± 58.2nm, 0.52 ± 0.06, −28.9 ± 2.3 mV for 20% HPβCD respectively. It can be concluded that HPβCD based nanogels can be promising carriers for FB as a chemopreventive agent.

Keywords: chemopreventive; flurbiprofen; cyclodextrin; solubility; nanogel

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