

ORIGINAL RESEARCH ARTICLES

SYNTHESIS, STRUCTURAL CHARACTERIZATION AND SOLUBILITY INVESTIGATION OF FLURBIPROFEN ISOBUTANOL AMMONIUM SALT

Vaibhavi P. Thakur^a, Pritam V. Bagwe^a, Prashant S. Kharkar^a and Shreerang V. Joshi^{a*}

(Received 29 July 2023) (Accepted 19 October 2023)

ABSTRACT

This research is centered on the conversion of active pharmaceutical ingredients (APIs) into salt formulations, aiming to enhance their solubility, improve absorption into the bloodstream, and ultimately elevate their therapeutic effectiveness. More specifically, it delves into the synthesis and detailed characterization of flurbiprofen isobutanol ammonium salt. The confirmation of salt formation was achieved through a comprehensive analytical approach, including differential scanning calorimetry (DSC), thermogravimetry analysis (TGA), Fourier transform infrared (FTIR) spectroscopy, and powder X-ray diffraction (XRD). Notably, the successful formation of the isobutanol ammonium salt was verified by the discernible differences in DSC curves between the parent drug and the salt form. Powder XRD analysis further provided evidence of a chemical reaction occurring between flurbiprofen and 2-amino-2-methylpropan-1-ol, resulting in the creation of a distinct salt entity. Solubility studies unequivocally demonstrated that the conversion of flurbiprofen into its salt form significantly increased its solubility. Thus, the conversion of flurbiprofen into an isobutanol ammonium salt offers a viable solution to address the inherent solubility challenge associated with this BCS Class II API. This transformation has the potential to substantially enhance the bio-availability of flurbiprofen and improve its therapeutic effectiveness.