

Co-amorphization of olanzapine and saccharin: a pathway to increase solubility in water

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PURPOSE

The production of co-amorphous mixtures has gained special relevance within the pharmaceutical industry since it allows to overcome the poor water solubility presented by most drugs (70-90%) [1] currently under research and development. Co-amorphous are defined as single phase mixtures of more than one compound that, due to e.g. the establishment of molecular bonds between the particles, prevents the recrystallization process [2]. The purpose of this work was the production and characterization of a stable co-amorphous mixture of olanzapine, a BCS class II antipsychotic.

METHODS

A mixture comprising olanzapine and saccharin in a 1:1 molar ratio was dissolved in dichloromethane and then the co-amorphization was carried out by solvent evaporation. The characterization of the material was achieved by differential scanning calorimetry (DSC), X-ray powder diffraction (XRPD) and Fourier-transform infrared spectroscopy (FTIR).

RESULTS

DSC confirmed the production of a co-amorphous mixture of olanzapine and saccharin, which was further validated using XRPD. FTIR analysis indicated the establishment of an intermolecular bond between the two compounds used, which in turn justifies the stability of the co-amorphous entity. Olanzapine solubility in water increased 114 times.

CONCLUSION

Solvent evaporation of a mixture of olanzapine and saccharine resulted in the production of a stable co-amorphous, promoting the water solubility of the drug.

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