

## **Formulation Development, Process Optimization and Comparative study of Poorly Compressible Drugs Ibuprofen, Acetaminophen Using Direct Compression and Top Spray Granulation Technique**

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**Abstract :** Ibuprofen and Acetaminophen is widely used as prescription & non-prescription medicine. Ibuprofen mainly used in the treatment of mild to moderate pain related to headache, migraine, postoperative condition and in the management of spondylitis, osteoarthritis and rheumatoid arthritis. Acetaminophen is used as an analgesic and antipyretic drug. Ibuprofen having high tendency of sticking to punches of tablet punching machine while Acetaminophen is not ordinarily compressible to tablet formulation because Acetaminophen crystals are very hard and brittle in nature and fracture very easily when compressed producing capping and laminating tablet defects therefore wet granulation method is used to make them compressible. The aim of study was to prepare Ibuprofen and Acetaminophen tablets by direct compression and top spray granulation technique. In this Investigation tablets were prepared by using directly compressible grade excipients. Dibasic calcium phosphate, lactose anhydrous (DCL21), microcrystalline cellulose (Avicel PH 101). In order to obtain best or optimized formulation, nine different formulations were generated among them batch F7, F8, F9 shows good results and within the acceptable limit. Formulation (F7) selected as optimize product on the basis of dissolution study. Furtherly, directly compressible granules of both drugs were prepared by using top spray granulation technique in fluidized bed processor equipment and compressed .In order to obtain best product process optimization was carried out by performing four trials in which various parameters like inlet air temperature, spray rate, peristaltic pump rpm, % LOD, properties of granules, blending time and hardness were optimized. Batch T3 coined as optimized batch on the basis physical & chemical evaluation. Finally formulations prepared by both techniques were compared.

**Keywords :** direct compression, top spray granulation, process optimization, blending time

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