**PURPOSE**

Ibuprofen possess challenges of low dissolution, poor flow properties and sticking tendency during commercial operations. Kolliphor® P188 micro (micropellet grade of Poloxamer 188) is an amphiphilic surfactants, having low melting point and also acts as hydrophilic lubricant. The objective of the present study was to develop solid oral formulation of Ibuprofen using twin screw hot melt granulation technology (TSHMG). The granules can be processed at relatively higher speeds compared to traditional hot melt extrusion process indicating commercial viability of process along with improved blend properties. The surfactant properties of poloxamers helps in achieving superior dissolution as compared to conventional formulations. TSHMG is a granulation process where a meltable binder is used which melts during mixing. Granules are obtained with minimum unit operations with improved micromeritic properties.

**METHOD**

In vitro dissolution study

- In vitro dissolution in pH 7.2 has revealed improved drug release as compared to marketed tablet. The disintegration time of optimized batch was also found minimum i.e. 83.5 ± 0.68 seconds.
- Marked improvement was observed in micromeritics properties of the hot melt granulated product as compared to API alone, physical mixture and conventional RMG granules.

<table>
<thead>
<tr>
<th>No.</th>
<th>IBF ratio</th>
<th>Kolliphor® P188 micro ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>93</td>
<td>07</td>
</tr>
<tr>
<td>2</td>
<td>95</td>
<td>05</td>
</tr>
<tr>
<td>3</td>
<td>97</td>
<td>03</td>
</tr>
</tbody>
</table>

**RESULTS**

DSC and XRD analysis

DSC and XRD analysis of optimized batches has confirmed no change in crystallinity, which is desirable attribute of typical continuous granulation process.

**CONCLUSION**

- Kolliphor® P188 micro is found to be excellent meltable binder for formulating denser and free flowing granules of Ibuprofen in the ratio of 95:05 (IBF:Kolliphor® P188 micro).
- It also acts as surfactant and also shows lubricating effects in granules as compared to conventional granules.
- TSHMG process is commercially viable with respect to high output and easy processing steps.
- This novel approach of continuous melt granulation by twin screw extruder using Kolliphor® P188 as a meltable binder can be utilized at industrial scale for high volume drug candidates.

**References**


**Grants**

UGC- India for research Fellowship to Mr. Jaywant Pawar.