Efficent Filler Type on Low Dose Acetaminophen Hydrophilic Matrix Formulations Prepared by a High Shear Wet Granulation Process

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Effects of various fillers on the phase separation behavior of hydrophilic matrices in a high shear wet granulation process are described. Dried granules were compared with respect to size, particle size distribution, flow and compaction properties. The blends were examined for particle size distribution using sieve analysis, powder flow using a vibratory funnel-type powder flowability tester (Sotax, USA), and bulk and tapped density. The latter values were used to calculate Carr’s compressibility indices. Physical Properties of Matrix Tablets Table 1. Composition of Hydrophilic Matrix Formulations

**Table 1.** Composition of Hydrophilic Matrix Formulations

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Supplier</th>
<th>Carr’s Compressibility (RAR)</th>
<th>Tap Density (g/cm³)</th>
<th>Bulk Density (g/cm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 (Starch)</td>
<td>Spectrum Chemical Company, USA</td>
<td>3.1</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>F2 (Lactose)</td>
<td>Magnesium stearate Mallinckrodt, USA</td>
<td>3.0</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>F3 (MCC)</td>
<td>(Emcocel 50M) Cabot Corp., USA</td>
<td>1.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>F4 (DCP)</td>
<td>(Cab-O-Sil M5P) Cabot Corp., USA</td>
<td>2.5</td>
<td>0.6</td>
<td>0.6</td>
</tr>
</tbody>
</table>

**Conclusions**

Disintegration profiles showed slightly faster release for Lactose (F2) tablets, however, F1 values showed similarly among all matrices using the drug release profiles for APAP. Further study is required for the evaluation of these matrices for different dosage forms. It is possible that for controlled release applications, a different concentration of the excipients may be required for the full performance of the matrices. The results of this study will be translated to the product development stage of a desired matrix system in the future.

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**References**


**Figure 1.** Tablet Thickening of Hydrophilic Matrix Formulations

**Figure 2.** Compression Force (KN) as a Function of Tablet Thickness at 100 rpm

**Figure 3.** Flow (g/sec) of Dry Blend (g/m3)

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