Pharmaceutical Analytical Chemistry: Open Access

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Novel direct compression polymeric excipients from chitin and its derivatives for pharmaceutical applications

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Abstract

Chitin and its derivative were investigated as novel direct compression (DC) excipients for immediate and controlled release applications. In the former, roller compaction technology was employed in a specific manner to convert the low bulk density, poor flowability and low compactibility of chitin powder into a DC excipient. In the latter, a combination of low molecular weight chitosan (LCS) with xanthan gum was found to provide the basis for controlled release preparations. The novel excipients were characterized using XRPD and FTIR tests. Compressibility and compactibility of the powders were examined thereafter using flow indices, Heckel and Kawakita analysis, and force-displacement curve. The novel excipients showed improvement in powder flow, high resistance to compression force, and high extent of plastic deformation. This work further elaborated on the role of LCS in the enhancement of powder compressibility and compacts strengths when mixed at an optimum mass content with the highly fragmenting xanthan gum. Dissolution profiles of metronidazole and metoprolol succinate tablets comprising the novel excipients confirmed their suitability in immediate and controlled release applications.

Biography

Abu Fara D. has completed his PhD from McGill University, Canada. He is associate professor at the Chemical Engineering Dept., University of Jordan, Jordan. His current research interest is in the field of the application of natural polymers in the pharmaceutical industry.

Citation: Abu Fara D, Novel direct compression polymeric excipients from chitin and its derivatives for pharmaceutical applications , Polymer Science and Technology 2020, Global Conference on Polymer Science and Technology, London, UK, June 09-10, 2020

J Pharm Anal Chem Open Access
ISSN: 2471-2698

Volume 5 | Issue 3