DOI: 10.14232/syrptbrs.2022.36

Comparison of two commonly used compression analyses for in-die and out of die performance

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The deformation behavior of materials is investigated by using compression analyses. A wide range of different equations can be applied to describe the compression behavior of materials. Heckel analysis is one of the most commonly used compression analyses to characterize the compressibility of a material [1]. In this study, Heckel analysis was compared to compressibility analysis [2]. For this purpose, both in-die and out of die methods of the analyses were performed. The compression analyses were carried out for twelve pharmaceutical excipients in order to verify the applicability of both methods for materials with varying properties. The in-die analysis was performed for six compression pressures. Besides the correlation between the in-die and out of die method, the correlation between both analyses was investigated.

Both methods generated comparable results for the in-die and out of die analysis. Since both analyses are intended to characterize the compressibility of the materials, the results should be similar. However, no correlation can be observed between the analytical methods. Compressibility analysis showed a lower sensitivity to the applied compression pressure as well as a wider linear range in the out of die analysis. Using this analysis could be advantageous over the Heckel analysis which is more commonly used. A comparison of both methods with other established methods for characterizing compressibility could allow a more conclusive evaluation.

References

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