

Multispectral UV imaging for fast and non-destructive quality control of chemical and physical tablet attributes - DTU Orbit (08/11/2017)

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Monitoring of tablet quality attributes in direct vicinity of the production process requires analytical techniques that allow fast, non-destructive, and accurate tablet characterization. The overall objective of this study was to investigate the applicability of multispectral UV imaging as a reliable, rapid technique for estimation of the tablet API content and tablet hardness, as well as determination of tablet intactness and the tablet surface density profile. One of the aims was to establish an image analysis approach based on multivariate image analysis and pattern recognition to evaluate the potential of UV imaging for automatized quality control of tablets with respect to their intactness and surface density profile. Various tablets of different composition and different quality regarding their API content, radial tensile strength, intactness, and surface density profile were prepared using an eccentric as well as a rotary tablet press at compression pressures from 20MPa up to 410MPa. It was found, that UV imaging can provide both, relevant information on chemical and physical tablet attributes. The tablet API content and radial tensile strength could be estimated by UV imaging combined with partial least squares analysis. Furthermore, an image analysis routine was developed and successfully applied to the UV images that provided qualitative information on physical tablet surface properties such as intactness and surface density profiles, as well as quantitative information on variations in the surface density. In conclusion, this study demonstrates that UV imaging combined with image analysis is an effective and non-destructive method to determine chemical and physical quality attributes of tablets and is a promising approach for (near) real-time monitoring of the tablet compaction process and formulation optimization purposes.

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