

Abstract

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Title of Thesis:	The preparation of tablets by laser sintering

This work focuses on the preparation of orally dispersible tablets by selective laser sintering (SLS). The present project is a pilot study conducted on the 3D printer Sintratec Kit at the Department of Pharmaceutical Technology. SLS is a 3D printing method based on the fusion of powder particles using a laser beam that sinters the individual particles together in the layers of material.¹⁻² The matrix forming polymer used in work was Kollidon[®] VA64 which was combined with two pigments namely Candurin[®] Gold Sheen and NTX Ruby Red. In addition, mixtures of the polymer with a co-processed dry binder Prosolv[®] ODT G2 and a physical mixture of mannitol, silicified microcrystalline cellulose, and crospovidone at the concentrations of 20%, 40%, and 60% were used. The influence of printing parameters, especially laser speed, on tablet quality was tested. NTX Ruby Red pigment was selected for final tablet printing. The best powder formulation for optimal printing progress and high-quality properties of the orally dispersible tablets was the mixture of Kollidon[®] VA64 with the addition of 40% Prosolv[®] ODT G2 or physical mixture. The optimum laser speeds for the preparation of placebo tablets were found to be 90 m.s⁻¹ and 100 m.s⁻¹. At this speed, tablets with 5% of the model drug were printed and showed acceptable mass uniformity, measurable destructive force, and disintegration time below one minute.