

## Effect of Particle Size, Compaction Force and Presence of Aerosil 200 on the Properties of Matrices Prepared from Physical Mixture of Propranolol Hydrochloride and Eudragit RS or RL

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### Abstract

#### Objective

Eudragits are widely used polymers in the production of oral sustained release dosage forms. The application of these polymers in the production of inert insoluble matrices has been investigated. However the effect of particle size, compaction force and presence of Aerosil 200 as a glidant on the properties of Eudragit RS and RL matrices prepared by direct compression of their physical mixtures with drug have not been fully investigated. This study was performed in order to investigate the effect of above mentioned factors on physicomechanical and release properties of propranolol hydrochloride and Eudragit RS or RL matrices.

#### Materials and Methods

Polymers were separated to different size fractions using series of sieves. Matrices were prepared in 1:3 ratio by direct compression of physical mixture of drug and polymer. To study the effect of Aerosil 200, matrices were prepared from different size fractions containing 1% w/w Aerosil 200. To investigate the effect of compaction force, the 125-177 $\mu$ m size fraction of polymer was chosen and compression carried out at 5, 10, 15, 20 and 30 kN compaction force. Matrices were characterized for their hardness and dissolution.

#### Results

The results showed that due to decrease in tablet hardness the release rate increased with increase in polymer particle size. Drug release rates were almost the same for both polymers at similar particle size range. The same trend was also observed for matrices containing Aerosil 200. Addition of Aerosil 200 decreased the rate of drug release from all matrices except those prepared from 250-350  $\mu$ m size fraction. This was attributed to increase in the tablet hardness. Increase in compaction force from 5kN to 20kN increased the tablet hardness and consequently decreased the release rate, however, further increase in compaction force from 20 to 30 kN did not significantly affect the release rates of drug.

#### Conclusion

Polymer particle size, presence of Aerosil and compaction force are important factors affecting drug release from Eudragit RS or RL matrices. Eudragit RS and RL polymers alone are not suitable for preparation of sustained release matrices containing water soluble drugs.

**Keywords:** Sustained release matrices, Eudragit, particle size, Aerosil 200, compaction force

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