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DETERMINATION OF OPTIMUM MIXING TIME OF THIAMINE HYDROCHLORIDE IN A VITAMIN B COMPLEX TABLETTING BLEND

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It is well known that, mixing operations are widely used in processes in production industry throughout Sri Lanka.

But the impotence of mixing operations have not yet been identified by the most of the industrialists, due to insufficient knowledge on fundamentals of mixing processes and as a result, the heavy financial losses incurred due to poor mixing can go un-identified. This situation will become worst, as there are no standards or codes available with regard to the mixing. Especially in solid mixing, due to the wide difference of properties of ingredients which are to be mixed, segregation will occur, the mixing for longer period will not improve the homogeneity of the blend.

Due to this characteristic, obtaining a well mixed blend, required for tabletting process, has become a major problem, in pharmaceutical industry where high level of homogeneity is required.

If the tablets are manufactured from a blend having low level of homogeneity, the sufficient amount of active ingredient may not be available in the tablet which leads to a situation where a disease of a patient would not recover, although he had administered correct dosage.

Therefore it is concluded that the mixing operation, directly affects, to the quality of the final product in pharmaceutical industry and therefore pharmaceutical industrialists have to direct their consideration very vitally to find out ways and means to achieve optimum mixing time in tabletting blends in order to obtain a quality final product.

The scope of this study covers how to find a mathematical approach to determine the optimum mixing time in a tabletting blend experimentally.

For this purpose, optimum mixing time of Thiamine Hydrochloride in a Vitamin B complex tabletting blend was determined experimentally and the experiment were carried out in State Pharmaceuticals Manufacturing Corporation (SPMC), Ratmalana.

These experiments were carried out by analysing the amount of Thiamine Hydrochloride presents in the random samples obtained at different accumulated mixing time from the Vitamin B complex tabletting blend.

The average concentration of Thiamine Hydrochloride in samples, were calculated and accordingly, variances were also calculated at each time.

By drawing the graph of variance against time, the optimum mixing time was determined by obtaining the point, at which the minimum variance occurs.

This experiment was repeated for three different mixing machines available in SPMC, so that followings were determined.

i) The optimum mixing time achievable in three mixing machines

ii) The mixing machine which gives minimum variance

iii) The mixing machine which gives minimum segregation.