Optimisation of independent variables

The numerical optimisation of fast dissolving tablets based on desirability approach is performed to obtain the levels of factor X1 and X2, which disintegrate rapidly with optimum hardness. The constraints, optimized level of factors and predicated responses are shown in table 6. Optimum amount of disintegrating agent and lubricant was found to be 4.15 mg and 1.57 mg, respectively. Optimized fast disintegrating tablets showed disintegration time of 22.35 (predicted), 22.12 ±3.2 (observed) seconds with hardness value of 3.00 (predicted), 3.08 ±0.31 (observed) kg/cm^{-2}.

Validation of the model

To determine the validity of generated mathematical model, formulations corresponding to optimum independent variable (factor) along with three additional random check point covering the entire range of experimental design were prepared. Responses were estimated for each one of these test runs, by use of the generated mathematical model (predicated value) and by the experimental processes (Actual value) (table 7). A high value of correlation coefficient r^2 (> 0.9) as well as lower value of percentage predication error, indicating validity and high predicative ability of response surface method (Fig.5).

CONCLUSION

In this study quality by design approach was used to optimise a fast dissolving tablet. The optimized formulation containing sodium starch glycolate (4.15 mg) and magnesium stearate (1.57 mg) showed rapid disintegration and optimum hardness, which was closed to the predicated value. Thus the quality by design can be a reliable approach for optimization of fast dissolving tablets.

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