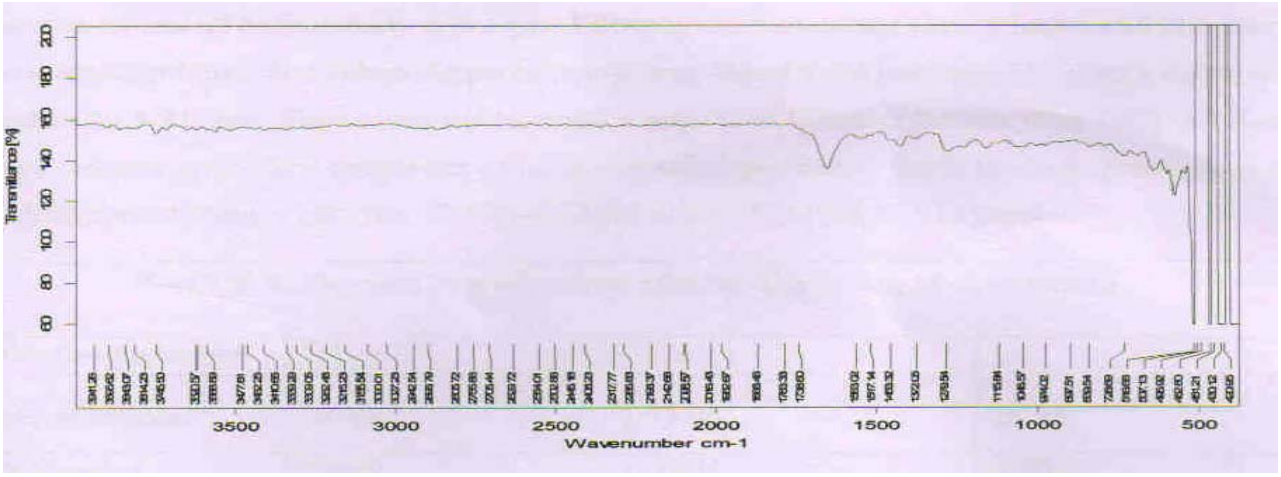


Infrared spectra of simvastatin & formulations containing PVP K-30 are presented in fig.1 simvastatin shows major peaks at 1266.95, 1164.49, 2923.50 & 1796 cm-1 assigned to –OH bending alcohol, C-O stretching ketone respectively & almost the similar bands are observed & identified in the spectrum of the formulation is shown in fig (a, b). Hence the study indicates that there was no drug-polymer interaction.

5) Physical Characteristics of Solid Dispersion Powder

Physical characteristics of solid dispersion powder were examined angle of repose, bulk density, tapped density, carr's index (CI), Hausner's ratio and values for which are reported in the table no. 8

Table 8

Properties	Range
Angle of repose	20-30
Bulk density	0.5938-0.6691
Tapped density	0.708-0.784
Carr's index	5%-18%

From the values of bulk and tapped density the values of carr's index and Hausner's ratio were calculated. The values angle of repose was found to be less than 25°. Carr's index was found to be 5-21 less. The value of Hausner's ratio was found to be less than 1.27. All these values indicate good flow properties of solid dispersed powder. Also study % practical yield and drug content ranges between 77.55% - 87.65% and 27.27µg/ml – 51.81µg/ml.

Table 9

Evaluation parameters	1:1	1:2	1:3
Angle of repose	24.44	23.96	25.45
Bulk density	0.495	0.595	0.605
Tapped density	0.63	0.626	0.6808
Hausner's ratio	1.272	1.050	1.1252
Carr's index	21.428	5.271	11.252
%practical yield	77.5%	82.133%	87.65%
Drug content	51.81	31.57	27.27

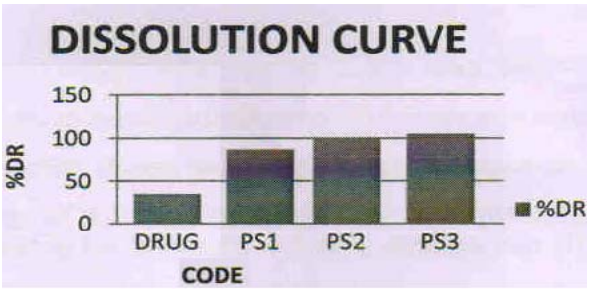
a) Dissolution Studies

The dissolution curves of simvastatin and its various binary systems with PVP K-30 in phosphate buffer 6.8

Table 10

Sr. no	Code	%DR
1	Drug	34.94
2	Ps1	86.64
3	Ps2	100.24
4	Ps3	104.37

The result of dissolution studies are shown in the table and the dissolution patterns in the graph. The results show that improvement in dissolution of solid dispersion as compares to pure simvastatin. It was observed that dissolution rate of drug polymer ratio was increased significantly compared to original drug. The increase in dissolution rate was found to be 2.5 fold greater in (1:1) ratio, while in case of (1:2) ratio dissolution pattern was found to be greater. In (1:3) ratio drug release pattern was found to be 2.6 fold greater than drug. The drug release in drug: polymer (1:1) ratio was found to be 86.64% in 16 min, in (1:2) ratio it was found to be 100.64% & in (1:) it was found to be 104.37%.



b) Evaluation of Simvastatin Tablet

Physiochemical evaluation of simvastatin tablet of different formulation were carried out, in that weight variation, hardness, friability, In-vitro disintegration time, Drug content study of tablet carried out.

Table 11: Evaluation of post-compression parameters of simvastatin oral dispersible tablet

F *code	Thickness (mm)	Hardness (kg/cm)	Friability (%)	DT* (Sec)	Weight variation (mg)	Drug content (%)
F1	7.3	3.4	1.197	35	Complies	81.23
F2	6.8	3.166	1.1	20	Complies	85.65
F3	7.3	3.7	1.3	30	Complies	56.23
F4	7.2	3.56	0.975	40	Complies	74.56
F5	7.0	3.7	1.057	45	Complies	45.56
F6	6.8	3.6	1.6	31	Complies	85.85
F7	7.1	3.7	0.9	51	Complies	69.25
F8	7.0	3.6	1.86	45	Complies	56.84
F9	7.7	3.5	1.17	35	Complies	89.54

The thickness was observed between 6.8-7.7mm respectively. Drug content of all formulations was observed between 45.56-89.54%. Whereas the weight of all formulation was complies hardness test for all formulation was carried out and observations obtained were in the range of 3.1-3.7 Kg/cm2. Test for friability was conducted for all formulations. % friability was found to be in the range of 0.9-186% in vitro disintegration time for all formulations was found to be in the range of 20-45 sec.

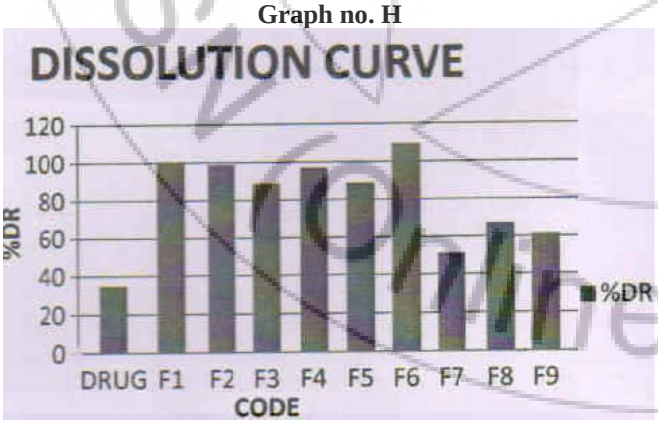
6) Dissolution Studies:

The dissolution curve of simvastatin tablet buffer 6.8

Table 12

Sr. No	Code	%DR
1	Drug	34.94
2	F1	100.74
3	F2	98.67
4	F3	88.73
5	F4	97.105
6	F5	88.88
7	F6	109.62
8	F7	51.05
9	F8	66.75
10	F9	61.10

Graph no. H



Observation showed that formulation F6 showed high drug release compared to drug and also other formulations.

11. Conclusion

Simvastatin is poorly water soluble drug hence by solid dispersion of simvastatin by Kneading method the dissolution of simvastatin is enhanced. The result showed that the dissolution rate of the drug in solid dispersed from higher than pure drug. It means solid dispersion form of simvastatin strongly improves the dissolution of simvastatin. Thus successful development of a novel simvastatin tablets fulfils the objectives of work.

12. Future Prospects

According to the present scenario of pharmaceutical industry, we can conclude that much effort must be taken for enhancing solubility of class 2 drugs to give life to the drug. Solid dispersion is one of the most promising techniques giving so many attractions from scientist due to its effects on improving solubility and dissolution rate of poorly soluble drug. Thus efforts must be taken to develop innovative for enhancement of class 2 drug.

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