

4. Ibuprofen

AIM:-

To perform ibuprofen including assay as per IP

REFERENCES

1. Tyagi S. A novel concept for enhancement of solubilization and bioavailability of poorly water soluble drugs: hydrotropy: a review. *Int J Pharm Res Biosci* 2013;2:372-81.
2. Kapadiya N, Singhi I, Mehta K, Karwani G, Dhruvo JS. Hydrotropy: a promising tool for solubility enhancement: a review. *Int J Drug Dev Res* 2011;3:26-33.
3. Maheshwari RK, Rajput MS, Sinha S. Ecofriendly spectro photometric estimation of tinidazole in tablet using Lignocaine hydrochloride as hydrotropic solubilizing agent. *Asian J Pharm* 2009;3(4):319-21.
4. Maheshwari RK, Rail N, Sharma S, Rajput MS, Soni S. New titrimetric analysis Furseimide in bulk and tablet using mixed hydrotropy concept. *Drug Invent Today* 2010;2(4):223-5.

APPARATUS

Apparatus

- 1) 250ml Flask (3)
- 2) 50ml burettes (2)
- 3) 600ml beaker
- 4) Burette clamp
- 5) Water bath

MATERIALS AND METHODS

All chemicals & solvents used were of analytical grade. A Shimadzu UV/VIS Spectrophotometer with 1 cm matched silica cells was employed for spectrophotometric analysis.

Preliminary solubility study of Ibuprofen

Solubility of selected bulk drug ibuprofen was determined in distilled water and in 8M urea solution at 28 ± 1 °. An excess amount of the drug was added to screw capped 30 ml glass vials containing distilled water and 8M urea solution. The vials were shaken mechanically for 12 hr at 28 ± 1 °, in an orbital shaker. These solutions were allowed to equilibrate for next 24hr and then centrifuged for 5 min at 2000 rpm. Supernatant of each vial was filtered through Whatman filter paper No.41. and filtrates were diluted suitably and analyzed spectrophotometrically against the solvent blank.

Analysis of bulk sample of ibuprofen by proposed method

For analysis of ibuprofen by proposed method (PM), accurately weighed quantity of ibuprofen sample (0.2 gm) was solubilized in 50 ml of 8M urea solution. The resultant solution was titrated with 0.1M sodium hydroxide solution using 0.1 ml phenolphthalein as an indicator. Necessary correction was made by conducting blank determination and the amount of ibuprofen drug was calculated.

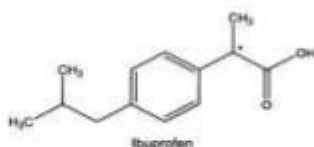
Analysis of ibuprofen by Indian pharmacopeial method [13]

For analysis of ibuprofen by Indian Pharmacopeial method (IPM), accurately weighed quantity of ibuprofen sample (0.2 gm) was solubilized in 50 ml of ethanol (95%). The resultant solution was titrated with 0.1M sodium hydroxide solution using 0.1 ml phenolphthalein as an indicator. Necessary correction was made by conducting blank determination and the amount of ibuprofen drug was calculated.

Table 1: Results of titrimetric analysis of ibuprofen bulk drug sample (n=3)

| Method | Percent drug estimated (mean \pm SD) | % coefficient Variation | Standard error |
|--------|--|-------------------------|----------------|
| IPM | 98.56 \pm 0.495 | 0.502 | 0.285 |
| PM | 98.67 \pm 0.640 | 0.648 | 0.369 |

STRUCTURE OF IBUPROFEN



RESULTS AND DISCUSSION

From solubility study, it was found that there was more than 10 fold enhancement in solubility of ibuprofen in 8M urea solution as compared to solubility in distilled water.

As evident from table no.1, the mean per cent estimated in the bulk drug sample of ibuprofen by I. P. and proposed method was 98.56% and 98.67% respectively. The results of analysis by the proposed method were very close to the results of analysis by standard Indian Pharmacopeial method. This confirms the accuracy of the proposed method.

The accuracy of the proposed method was validated statistically by low values of standard deviation, % coefficient of variation and standard error.

CONCLUSION

Thus, it may be concluded that the proposed method of analysis is new, rapid, simple, cost-effective, environmentally friendly, safe, accurate and reproducible. This method can be successfully employed in the routine analysis of ibuprofen in bulk drug sample. There is good scope for other poorly water soluble drug which may be tried to get solubilized by suitable hydrotropic agent to carry out their titrimetric analysis excluding the use of costlier, unsafe, volatile, pollution causing organic solvents.