SHORT COMMUNICATIONS

Computer Simulation of *in vitro* Drug Release Data and its Kinetic Interpretation

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In view of the limited information available on computer simulation of *in vitro* drug release data, a software is developed in a structured language 'C'. Upon feeding the values of absorbance and time data, the values of percent cumulative drug release, percent drug unreleased, log percent drug unreleased and finally the coefficient of correlation values for zero order, Higuchi model and first order are displayed in a tabular form which helps in predicting the actual release kinetics. The Unix'C' is simple, useful and intelligible.

A software is developed in the structured programming language'C'1-3, to get the drug release profile from the optical density and fit it into the selected kinetic models. The dissolution profiles of formulations such as transdermal films, microcapsules, sustained release formulations etc. can be studied using this programme. The salient feature of this programme is that the *in vitro* drug release profiles such as percent cumulative drug release, percent drug unreleased, log percent unreleased and the coefficient of correlation (r) are obtained simply by feeding the absorbance and the time data. Also the users have the liberty of transfering the results to the printer.

Using the linear regression analysis, the correlation coefficient has been derived from the equations for zero order, Higuchi model and first order release mechanisms to predict the actual order of release kinetics. The different kinetic models proposed are[4-6]:

Zero order mechanism

$$M_t = f(t) \quad \ldots\ldots (1)$$

Higuchi model

$$M_t = f\sqrt{(t)} \quad \ldots\ldots (2)$$

First order mechanism

$$\text{Log}\,(M_o - M_t) = f(t) \quad \ldots\ldots (3)$$

(Where M_t is the amount of drug release at time (t) and M_o is the initial drug loading).

The sequence of entering the data is as follows : the E (1%, 1cm) value, dilution factor, corrected volume and total drug content in the dosage form are to be entered one after the other. Then the number of runs and number of observations are to be entered in a similar fashion. On pressing "ENTER" key one after the other, a series of the table are displayed in the following order :

The results of concentration, correction factor, cumulative % drug release % unreleased data, log % unreleased data, mean ± SD (of % release) and correlation coefficient are diaplayed in tabular form.

In the correlation coefficient (r) table the r-value for different release equations is in the following fashion.

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	Zero order	First order	Higuchi
Col.1			
Col.2			
Col.3			

The equation showing r-value very close to unity represents the mode of the *in vitro* release pattern.

In conclusion, with this programme one can rapidly decide about the release kinetic pattern of the selected formulation. The listing of the computer program is available from authors on request.

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Spectrophotometric Determination of Dopamine Hydrochloride

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A simple and sensitive spectrophotometric method for the determination of Dopamine HCl is described. The method involves the formation of a nitroso derivative followed by the formation of an azo red compound with sulphamic acid in the presence of alkali. The method described is precise, accurate and reproducible and is extended to the analysis of an injectionable formulation.

DOPAMINE is a naturally occurring organic amine and its hydrochloride salt is being used in the treatment of acute congestive failure and renal failure.[1] Apart from the fluorometric, HPLC and TLC methods,[2,3] a few spectrophotometric methods have been reported for the determination of dopamine HCl. In the present communication, the development of a visible spectrophotometric method and its application for routine analysis of dopamine hydrochloride injection is described.

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