CHAPTER V

CONCLUSION

Chemometrics has generated much interest in analytical molecular spectroscopy, e.g., useful information by multivariate calibration methods. Clear explanations of the different chemometric methods and properly designed user-friendly software should provide a bridge between chemometrician/mathematicians and potential spectroscopic users, enabling them to make successful use of these powerful tools

The PCR and PLSR method used in this work can be used as a statistical method for manipulation of the experimental data obtained from spectrophotometry. In this study, the quantities of chlorzoxazone and paracetamol have been determined simultaneously in tablets. The optimized calibration model contained 26 calibration mixtures of both compounds at various concentrations. For chlorzoxazone, the spectral zone of the wavelength range 270-295 nm with two principal components were selected and used for both PCR and PLSR models. For paracetamol, the spectral zone of the following wavelength range: 230-350 nm with two principal components and 230-270 nm with three principal components, were selected and used for the PCR and PLSR models, respectively. The accuracy was assessed by performing three replicate determinations of spiked placebo at five concentrations. The obtained results gave acceptable mean recovery values (in the range of 104.52-109.53% for chlorzoxazone and 101.16%-103.94% for paracetamol). The precision expressed as relative standard deviation, was obtained satisfactory for both compounds (% RSD not more than 2.0). The slope and coefficient of determination presented was linear (r^2 not less than 0.9997). In addition, no statistically significant difference between the results of chlorzoxazone and paracetamol obtained from PCR and PLSR models. The proposed methods have been applied to simultaneous quantitation of chlorzoxazone and paracetamol in two commercial tablets, containing chlorzoxazone and paracetamol in the ratio of 12.5: 15.

The obtained results of these drugs had acceptable percentage of the labeled amount (90-110% LA).

In conclusion, the joint use of spectrophotometry and multivariate methods, PCR and PLSR, for the resolution of mixtures of analytes with overlapped spectra is an effective choice for developing new analytical methods as well as for the quality control of pharmaceutical preparations and for the avoidance of some steps (e.g. separation, extraction and pre-concentration) of classical determination processes. The proposed methods allow satisfactory simultaneous determination of chlorzoxazone and paracetamol in pharmaceutical preparations available in Thailand. These methods are rapid, simple to perform, and inexpensive, using only conventional instrumentation and the appropriate software, but the methods could not be considered as the stability indicating assays due to limitation of UV-Vis absorption spectrophotmetry