



ChemTech

International Journal of ChemTech Research

CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.9, No.06 pp 282-288, 2016

Simultaneous determination of Dopamine and Ascorbic acid in real samples by Partial Least Squares method

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Abstract: Partial least squares (PLS) is multivariate calibration method that allows simultaneous determination of several analyte in spite of their overlapping spectra. In this research, a spectrophotometric method using PLS is proposed for the simultaneous determination of ascorbic acid (AA), dopamine (DA). The linear concentration ranges for AA and DA were 1.73–28.66, 1.89–151.23 (ng mL^{-1}), respectively. However, PLS was applied to design calibration set based on absorption spectra in the 220–300 nm range for 16 different mixtures of AA, DA in all cases. Cross validation method was used to select the optimum number of principal components (NPC). The NPC for AA and DA was found to be 2 by PLS. Prediction error sum of squares (PRESS) of AA, DA were 0.58 and 0.74. For PLS Satisfactory results were achieved for the simultaneous determination of AA and DA in some real samples such as human urine, serum and plasma.

Keywords: Dopamine and Ascorbic acid, Partial Least Squares method.

Omid Espergham et al /International Journal of ChemTech Research, 2016,9(6),pp 282-288.
