

ABSTRACT

METHOD VALIDATION OF FLAME ATOMIC ABSORPTION SPECTROMETRY (FAAS) FOR THE DETERMINATION OF MINERAL (Ca, Cu, Mn and Zn) IN CAPLET DOSAGE FORM

WAYAN GDE SEPTADI

The objective of the present study was to validate the Flame Atomic Absorption Spectrometry (FAAS) for the determination of mineral, such as Ca (calcium), Cu (copper), Mn (manganese) and Zn (zinc) in caplet dosage form. The method involves the separation of minerals from the matrix by destruction of the organic matter of the sample through the combination of dry ashing (550 ± 20 °C for 2 hours or until it becomes ashes) and wet ashing with a mixture of 6 M HCl and concentrated HNO_3 (20:1). The method validation comprises of the study of selectivity, linearity, limit of detection (LOD), limit of quantitation (LOQ), precision and accuracy. The proposed method was linear over the concentration ranges of 4.99-15.99 $\mu\text{g/mL}$ for Ca, 0.51-2.04 $\mu\text{g/mL}$ for Cu, 1.03-8.25 $\mu\text{g/mL}$ for Mn, 2.04-10.22 $\mu\text{g/mL}$ for Zn. The correlation coefficient (r) obtained for these regressions is higher than 0.999 and the relative process standard deviation value (V_{x0}) is not more than 5 %. Limit of detection (LOD) of Ca, Cu, Mn and Zn were found to be 0.42 $\mu\text{g/mL}$, 7.39×10^{-3} $\mu\text{g/mL}$, 0,02 $\mu\text{g/mL}$ and 0.08 $\mu\text{g/mL}$, respectively. While limit of quantitation (LOQ) were found to be 1.28 $\mu\text{g/mL}$, 0.02 $\mu\text{g/mL}$, 0.05 $\mu\text{g/mL}$ and 0.24 $\mu\text{g/mL}$ for Ca, Cu, Mn and Zn, respectively. The method was successfully applied for determination of the minerals e.g. Ca, Cu, Mn and Zn in caplet dosage form.

Keywords : method validation, FAAS, calcium, copper, manganese and zinc, caplet dosage form.