

Using two-photon excitation methods for determination of Ca²⁺ in contamination with protein - full length research paper.

ABSTRACT

Three emission wavelengths from two-photon excitation techniques were used to determine free Ca²⁺ using a new analytical calculation. This was achieved by considering the interaction of protein with free Ca²⁺ and indo-1 in protein contaminated sample. The emissions obtained from the excitation with the dissociation constants were used in the calculation. Agreement values of the Ca²⁺ from the calculation with the known Ca²⁺ buffer solution used for the measurement was obtained for various Ca²⁺ and protein concentration. The analytical analysis shows that dissociation constants for each binding's deviation errors are small to affect free Ca²⁺ determination. This would provide an accurate measurement of free Ca²⁺ in biological cells than the typical two emission wavelength processes. Furthermore, using two-photon excitation methods, deep inside cells observation of free Ca²⁺ are possible using the methods introduced.

Keyword: Free Ca²⁺; indo-1; two-photon excitation methods.