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DETERMINATION OF VERAPAMIL HCL IN PHARMACEUTICAL PREPARATIONS BY A FLUORESCENT NANO PROBE BASED ON CDTE/CDS/ZNS QUANTUM DOTS

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Introduction: This research was aimed to design a method to determine verapamil HCl in dosage forms by using CdTe/CdS/ZnS core-shell QDs as a fluorescent probe.

Methods: CdTe/CdS/ZnS quantum dots were prepared by one pot method and analyzed. An analytical technique based on fluorescence quenching of QDs was developed to quantify verapamil in commercially available preparations. Various reaction parameters were optimized and the method developed was validated. One way ANOVA and Post Hoc tests at 5% significance level, were performed to justify the significance of variation in observations.

Results: Linear range of the verapamil concentration was 0.25-5 µg/mL while limit of detection was 0.05µg/mL. Recovery and relative standard deviations were NMT±10% of the actual amount and <5.9%, respectively. Foreign materials, common metal ions and pharmaceutical excipients of dosage forms, had little interference. Verapamil content in the tablets and injections was NMT±10% of the stated amount and it conformed to the specifications of both the British Pharmacopoeia and the United States Pharmacopoeia. In case of statistical analysis, p-value was <0.05 in almost all levels of all parameters until the optimized level of system.

Conclusions: It can be concluded from the results that the method designed is simple, reliable, cost effective, selective, rapid and sensitive enough to be used for quantitative measurement of the verapamil HCl in dosage forms for quality control purposes.

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