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Kinetic spectrophotometric determination of brilliant green in the presence of Triton X-100

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Development of new methods for determination of toxic chemical residues in aquatic systems has received considerable interests in recent years. Brilliant green (BG) [4- (Diethylamino) cyclohexa-2,5-dien-1-yliden] diethyl ammonium hydrogen sulfate is a dye in the triphenylmethane family that has antifungal properties [1]. The toxicity of (BG) in many countries, have prohibited the use of this dye in fish raised for human consumption. The use of BG more than standard range has caused enviromental contamination and affected human health and for example causen carcinogenic and mutagenic properties. In this research a novel kinetic spectrophotometric method for the accurate and sensitive determination of BG has been reported [2]. The method is based on selective interaction of (BG) with triton x-100. The interaction was monitored spectrophotometrically by measuring the change in BG absorbance (ΔA) at 634 nm during the variable times of 0 to 900 s. The effect of variables on the interaction rate of BG and triton x-100 were investigated in order to establish the optimum conditions. Brilliant green can be measured in the linear range of 1.0 to 12.0 μg mL^{-1} with detection limit of 0.047 μg mL^{-1}. The relative standard deviations for five replicate in three levels of BG concentration (2, 6 and 10 μg mL^{-1}) were of 1.75% to 8.18 %. This method was used to BG determination in simulated textile dye effluent and goldfish farming water with satisfactory results.
Key words: Kinetic spectrophotometric; Brilliant green; Triton x-100.

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Rapid flow-injection chemiluminescence determination of naphazoline hydrochloride

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Chemiluminescence (CL) is generally defined as the emission of light (ultraviolet, visible, or infrared) during the process of a chemical reaction [1]. The coupling flow techniques with CL detection is becoming increasingly important in pharmaceutical analysis as well as food, biological, and environmental analysis because of widely recognized advantages including high sensitivity, wide linear dynamic range, reproducibility, simplicity, rapidity, and feasibility [2]. Recently, Iranifam M. has reviewed comprehensively the findings of studies published from 2007 to May 2012 that report flow-CL methods for pharmaceutical (drug) analysis [3].
Naphazoline hydrochloride (NPZ), [2-(naphthalene-1-yl-methyl)-4,5-dihydro-1*H*-imidazole hydrochloride] is a decongestant and is used to treat nasal congestion and as an ophthalmic vasoconstrictor to decrease redness and itching [4]. The chemical structure of NPZ belonging to the imidazoline class of sympathomimetics is demonstrated in Fig. 1. NPZ determination is important in drug preparation quality control.
In this work, a simple and sensitive flow-injection chemiluminescence (FI-CL) method was developed for the determination of naphazoline hydrochloride. The method is based on the enhancing effect of naphazoline hydrochloride on the weak CL signal eliciting from the reaction of KIO_4 with H_2O_2. The experimental conditions that affected the CL signal were carefully optimized. Under the optimum conditions, the increment of CL intensity was linearly proportional to the concentration of NPZ ranging from 5.0×10^{-6} to 70×10^{-6} mol/L. The detection limit was 1×10^{-6} mol/L and the relative standard deviation for 50×10^{-6} mol/L naphazoline hydrochloride solution was 2.8% ($n = 11$). Besides of this, a high injection throughput of 120 sample h^{-1} was also achieved. The utility of this method was demonstrated by determining naphazoline hydrochloride in pharmaceuticals.
Keywords: flow-injection; chemiluminescence; naphazoline hydrochloride

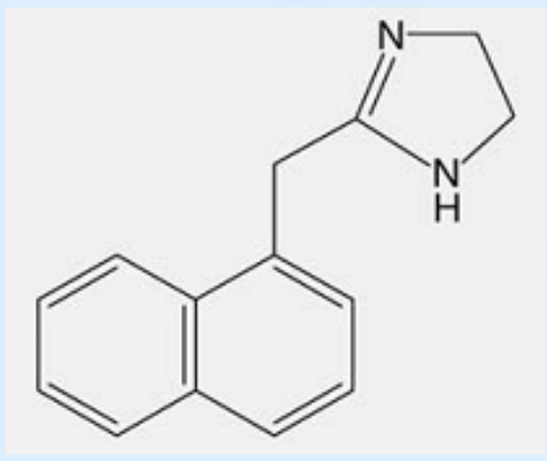

Fig. 1: Chemical Structure of naphazoline hydrochloride

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