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## Investigation Of Persistence Of Pesticides In Water Samples

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### Abstract

This approach is to estimate amount of **pesticides** in water samples based on reduction behaviour on the surface of working electrode by using adsorptive stripping voltammetry. Carbon nano tubes paste electrodes used as working electrodes. Water samples of different regions are collected and investigated for persistence of pesticides.

Key words: Pesticides, Adsorptive Stripping Voltammetry, Carbon Nano Tubes Paste Electrodes Water Samples.

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### Introduction

All though pesticides has significant role in anticipating the hurdles which are responsible for decreasing the outcomes of food and related products. At the same time if pesticide are not employed in proper way, they can manipulate human health or source for severe damage or death to the pesticide machinists well as other non target species. Although there are several analytical methods are in force being the selected method is less tedious and viable. In this experiment an Adsorptive Stripping Voltammetry [1-5] supported by statistical findings was employed.

### Instrumentation and Reagents

investigation conducted using a model meterohm Auto Lab 101 PG stat (Netherlands). CNTPE as working electrode for differential pulse adsorptive stripping voltammetry and cyclic voltammetry. pH measurements were carried out with an Eutech PC\_510 cyber scan. Meltzer Toledo (Japan) Xp26 delta range micro balancer were used to weigh the samples during the preparation of standard solutions. All the experiments were performed at 25<sup>0</sup>C.

All reagents used are analytical reagent grade. Double distilled water was used throughout the analysis. In the present investigation universal buffers of pH 4.0 was used as supporting electrolytes .

### Computations

In this experiment, the voltammetric output of the unknown is first recorded after which a known volume of standard solution of the same electro active species is added to the cell and second voltammogram is taken. From the magnitude of the peak height, the unknown concentration of species may be calculated using the following formula[6].

$$C (\text{un known}) = \frac{C_s \times V}{V_i \times i_2} \times i_1$$

### Inter pretations

Fine resolvable peak obtained for each sample is useful for the analysis of water samples. The optimum pH to get well defined peak for the detection is found to be 5.0. The peak current is found to vary linearly with the concentration of the pesticide over the range  $1.03 \times 10^{-5}\text{M}$  to  $1.04 \times 10^{-9}\text{M}$ . The lower detection was limit found to be  $1.02 \times 10^{-9}\text{M}$ . The correlation coefficient and relative standard deviation (for 5 replicates) obtained using the above procedure.

### Recovery experiments

A stock solution ( $1.0 \times 10^{-3}\text{ M}$ ) of each sample is prepared in dimethyl formamide. In voltammetric cell, 1 mL of standard solution is taken and 9 mL of the supporting electrolyte (pH 4.0) is added to it. Then the solution is deaerated with nitrogen gas for 10 min. after obtaining the voltammogram, small additions of standard solution are added and the voltammograms are recorded under similar experimental conditions. The optimum conditions for analytical estimation at pH 5.0 are found to be pulse amplitude of 30 mV, applied potential of -0.45V and scan rate  $40\text{ mVs}^{-1}$ .

Samples are collected from paddy fields which sprayed by the pesticide under investigation 48 hours after spraying the pesticides. These samples were filtered through a Whatman No.41 filter paper and Aliquots of water samples were taken in a to it buffer solution was added and analyzed as described above. The recoveries of samples obtained in water samples ranged from 95.00 to 97.00% and the results are summarized in Table 1.0.

**Table 1.0: Recoveries of dinitroaniline herbicides in water samples**

Name of the pesticide	Amount added (mg/L)	Amount found (mg/L)	*Recovery (%)	Standard deviation
Oryzaline	5.0	4.75	95.00	0.07
Nitralin	5.0	4.85	97.00	0.05
Profluraline	5.0	4.82	96.40	0.16

## Conclusions

This work is very useful to estimate the persistence of pesticide in environment and based on this type of analytical approaches one can guide the applicant regarding the selection of pesticides with least persistence.

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