

AN INEXPENSIVE METHOD OF DETERMINATION OF FLUORIDE

A dissertation submitted in partial fulfillment of requirements for the
Master's Degree of Science in Chemistry

By

Upendra Adhikari

Roll No. 1481(2065)

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Central Department of Chemistry

Tribhuvan University

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Tribhuvan University
Institute of Science and Technology
Central Department of Chemistry
Kirtipur, Kathmandu, Nepal

The dissertation entitled
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FLUORIDE”**

Submitted by

Upendra Adhikari

Roll No. 1481(2062/2064 Batch)

has been accepted as a partial fulfillment of the requirements for the
Master’s Degree of Science in Chemistry

.....
Prof. Dr. Tulsi Prasad Pathak

Head

Central Department of Chemistry, T.U.

Kirtipur, Kathmandu, Nepal

.....
External Examiner

.....
Supervisor

Prof. Dr. Raja Ram Pradhananga

Central Department of Chemistry

Tribhuvan University

Kirtipur, Kathmandu, Nepal

Foreword

The entire work presented in this dissertation has been carried out by Mr. Upendra Adhikari under my supervision in the academic year 2005/2007 (2602/2064). During the research period he performed his work sincerely and satisfactorily. No part of this dissertation had been submitted for any other degrees.

Prof. Dr. Raja Ram Pradhananga

Central Department of chemistry

Tribhuvan University

Kirtipur, Kathmandu, Nepal

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ABSTRACT

An inexpensive spectrophotometric method of determination of fluoride in water is developed which is based on bleaching action of fluoride ions on the coloured complex of Fe (III) with salicylic acid to form stable, colourless hexafluoride complex of iron. The conditions of the method (pH, stability and combination ratio) were studied and a standard curve was obtained for 0-20 mg F/L at 525nm. A study was conducted on interference with complexing cations that react with fluoride ions and anions that react with Fe (III) to give more stable complex than Fe (III)-fluoride complex. The results obtained from this method are compared with standard SPADNS-Zirconyl chloride method. The results obtained are in good agreement with SPADNS- Zirconyl chloride method of determination of fluoride. The calibration sensitivity of the method is found to be $0.042 \mu\text{g}^{-1} \text{mL cm}^{-1}$. The detection limit is found to be $1.1 \mu\text{g mL}^{-1}$ at 98.3% confidence level. The sandell's sensitivity of the method is found to be $0.02 \mu\text{g mL}^{-1} \text{cm}^{-2}$.

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