Association Française pour l'Etude des Eaux

DOCUMENT NON SELECTIONNE

Trop spécialisé ☐
Sans intérêt ☐
Pas de mon domaine ☐
Pas le temps ☐

NUMERO G 11323

NOM : M. MONTIEL

DATE ENVOI : 25 OCT. 1990

DATE RETOUR : 14 NOV. 1990

*AUTEURS .FRIEDMAN LC,FISHMAN MJ 66/71701

*TYPE .RAPPORT

*TITRE .Evaluation of methods used from 1965 through 1982 to *determine inorganic constituents in water samples

*SOURCE .DENVER,US GEOL SURV

*DATE .1989

*PAGES .126

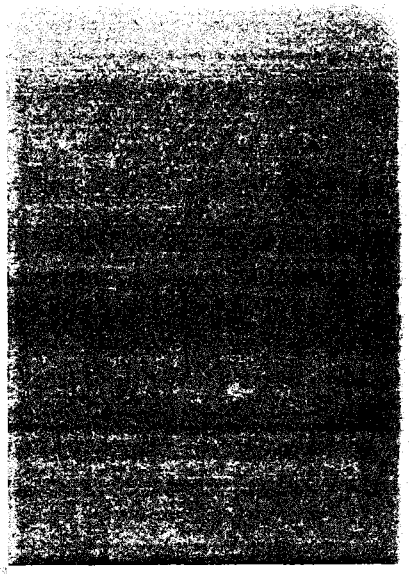
*COTE .G11323

Titre original :

Dosage des micropolluants minéraux. Les différentes méthodes d'analyses utilisées de 1965 à 1983. Nombreuses courbes et diagrammes avec une bonne présentation. G 11323.

Evaluation of Methods Used from 1965 Through 1982 to Determine Inorganic Constituents in Water Samples

66/71701



United States
Geological
Survey
Water-Supply
Paper 2293

G11323

CONTENTS

Abstract 1
Introduction 1
    Methods 1
    Calculation, presentation, and evaluation of data 2
Acidity 5
Alkalinity as calcium carbonate 5
Aluminum 8
Ammonia nitrogen 11
Ammonia plus organic nitrogen 14
Antimony 17
Arsenic 20
Barium 23
Beryllium 26
Boron 29
Bromide 32
Cadmium 32
Calcium 35
Chloride 38
Chromium 41
Cobalt 44
Copper 47
Dissolved solids 50
Fluoride 50
Hardness 54
Iodide 54
Iron 54
Lead 58
Lithium 61
Magnesium 64
Manganese 67
Mercury 70
Molybdenum 73
Nickel 76
Nitrate nitrogen 79
Nitrite nitrogen 82
Nitrite plus nitrate nitrogen 85
Organic nitrogen 88
Orthophosphate phosphorus 91
Phosphorus 94
Potassium 97
Selenium 100
Silica 103
Silver 106
Sodium 109
Specific conductance 112
Strontium 112
Sulfate 116
Thallium 119
Vanadium 119
Zinc 123
References 126

Evaluation of Methods Used from 1965 Through 1982 to Determine Inorganic Constituents in Water Samples

By Linda C. Friedman and Marvin J. Fishman

Abstract

Since 1962, the U.S. Geological Survey has prepared and distributed Standard Reference Water Samples (SRWS) to participating laboratories in order to alert them to possible analytical deficiencies. This report marks the first time that a concentrated effort has been made to examine and compare the SRWS data for each constituent by the analytical method that was used to obtain the data.

Unlike laboratories that participate in interlaboratory studies that are designed to determine the precision and accuracy of a particular analytical method, laboratories that participate in the SRWS program are allowed to select the method used to analyze a reference sample and are requested to report the method used. Data for a particular method could not be compared with a "true" value because the data were obtained from analyses of reference samples that were prepared using natural waters; however, where possible a comparison was made between the mean concentrations obtained by the various analytical methods that were used to determine each constituent. Where enough information is available, models for predicting the precisions of the methods have been developed, and the precisions have been compared. In addition to the data presented in the reports, this evaluation provides a good indication of methods that were used routinely to analyze water samples during the 18 years of study.

INTRODUCTION

The U.S. Geological Survey collects more data on the Nation's water resources than any other government agency. Its involvement in water-quality activities dates back to 1879 (Durum, 1978). Over the years, many analytical methods have been used to obtain water-quality data, both within and outside the U.S. Geological Survey. Use of data obtained from more than one method raises the possibility of data-interpretation problems because analytical precision and bias may vary with analytical method. The number of new analytical methods, such as atomic absorption spectrometry, used to obtain water-quality data began to increase rapidly in the 1960's; therefore, the possibility of data-interpretation problems also increased.

The information in this paper is based on 18 years of results from interlaboratory analyses of reference materials. The authors hope that the information provided herein can aid in the interpretation of water-quality data.

As part of its water-quality effort, the U.S. Geological Survey has prepared and distributed reference materials since 1962. Information concerning this program can be found in publications by Skougstad and Fishman (1975), Schroder and others (1980), and Friedman and Erdmann (1982). The Standard Reference Water Samples (SRWS) of the U.S. Geological Survey are stabilized, homogeneous waters that contain ambient or working-level concentrations of primarily inorganic constituents, thus meeting Uriano and Gravatt's (1977) general definition of reference materials. These samples, which are distributed semiannually, serve as a quality-control tool to alert participating laboratories to possible analytical problems. Data from interlaboratory analyses are statistically evaluated; outlying values are rejected based on the T value (Grubbs test) as described in the American Society for Testing and Materials (ASTM) Standard E-178-80 (1980); and the mean, standard deviation, range, and 95-percent confidence interval are calculated and reported for each constituent for each sample. Publications by Janzer (1983) and Janzer and Latal (1984) provide examples of the type of reports that are produced.

Methods

Unlike laboratories that participate in interlaboratory studies that are designed to determine the precision and accuracy of a particular analytical method, laboratories that participate in the SRWS program are allowed to select the method used to analyze a reference sample, and are requested to report that method. This report is