FY 1998 Project for the Advisement of Sustainable Development Support
Commissioned by Environment Agency, Government of Japan

Text Book

for

Basic Operations in Chemical Analysis

- Analysis Video Series for Environmental Technology Transfer -

March 1999

Overseas Environmental Cooperation Center, Japan

TABLE OF CONTENTS

INTRODUCTION

This video series was produced by Overseas Environmental Cooperation Center, Japan sponsored by the Environmental Agency of Japan in 1998 to provide audiovisual assistance for experts who are teaching basic laboratory techniques in developing countries. This video, entitled “Basic Operations in Chemical Analysis”, aims to teach the basic techniques for environmental analysis. It covers four primary themes: washing and storing glassware, making pure water and checking the water purity, diluting standard solutions, and some basic techniques for titration.

In the production of this video, a committee was established to examine and discuss the contents of the video. The members of the committee are as follows:

Chairman

Hajime Shirayama	Executive Assistant Researcher, Environmental Science Research Center, Toyama Prefecture

Member

Koichiro Hirano	Chief Engineer, Research Institute for Environmental Science Yokohama City
Kazuo Makino	Chief Professor, National Environmental Training Institute, Environment Agency
Hiroshi Murata	Director, Environmental Coordination Division, Administration Center for Miura and Yokosuka District, Kanagawa Prefecture
Yoshichika Watanabe	Former Chief Professor, National Environmental Training Institute, Environment Agency

1. Contents of the Video:

1) Prologue:

-Discusses the need for objective monitoring and environmental analysis in the context of environmental policy.

-Explains the necessity of proper laboratory techniques in obtaining accurate environmental data.

-Gives an overview of the contents of the video.

2) Washing and storing glassware:

-Refers to the importance of washing glassware.

-Explains that environmental analysts are responsible for properly instructing personnel on washing techniques and the necessity of washing glassware.

-Describes the basic techniques for washing, rinsing glassware.

-Describes the basic techniques to wash, rinse, dry, and store pipettes.

-Explains the manner to wash using ultrasonic cleaner and the manner to soak dirty items over night in a rinsing bath.

3) Making pure water and checking the water purity:

-Describes the construction and use of a water distilling device made of glassware, a lower-cost technique that can be used for water purification in developing countries.

-Describes commercially available water purification systems (image only).

4) Diluting standard solutions

-Explains the basic characteristics of volumetric glassware and basic techniques of handling pipettes and flasks in diluting the standard solution.

-Presents an example of spectrophotometric analysis of nitrite, to demonstrate a typical application of diluted standard solutions.

5) Basic techniques for titration

-Explains techniques for using burettes in volumetric analysis.

-Presents an example of iodometry to assess dissolved oxygen in water.

2. Contents of Attached Text (Appendix to Video):

Part Ⅰ ENGLISH NARRATION

- Prologue
- Washing and keeping of glassware
- Pure water making and purity check
- Dilution of standard solutions
- Absorptiometric analysis of nitrite ion
- Titration
- Epilogue

Part Ⅱ DETAILED EXPLANATION NOT GIVEN IN THE VIDEO

Chapter 1. : Prologue: Necessity and importance of environmental analysis

Chapter 2. : Washing and storing glassware

Chapter 3. : Making pure water and checking the water purity:

Chapter 4. : Diluting standard solutions

Chapter 5. : Basic techniques for titration