AS 3741—1990

Australian Standard®

Recommended practice for chemical analysis by ion chromatography

This Australian Standard was prepared by Committee CH/23, General Methods of Chemical Analysis. It was approved on behalf of the Council of Standards Australia on 28 August 1989 and published on 9 February 1990.

The following interests are represented on Committee CH/23:

Australian Government Analytical Laboratories
Australian Institute of Food Science and Technology
Australian Mineral Development Laboratories
Confederation of Australian Industry
National Association of Testing Authorities, Australia
National Health and Medical Research Council
Railways of Australia Committee
Royal Australian Chemical Institute
University of Sydney

Additional interests participating in the preparation of this Standard:

Department of Water Resources, N.S.W.
Instrument manufacturers
Instrument pump manufacturers
Iron and steel manufacturers
Surfactant manufacturers
Sydney Technical College
University of New South Wales
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PREFACE

This Standard was prepared by the Standards Australia Committee on General Methods of Chemical Analysis under the direction of the Chemical Standards Board. This Standard describes both suppressed and non-suppressed ion chromatographic techniques and their use in methods of chemical analysis. The recommendations herein are intended to apply to Australian Standard methods for ion chromatography.

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SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard sets out recommendations for instrumentation and operating techniques suitable for chemical analysis of both cationic and anionic species by non-suppressed (sometimes referred to as electronic suppression) and suppressed (sometimes referred to as chemical suppression) ion chromatographic techniques. Accepted methods of ion chromatography are based on ion-exchange, ion-pairing or ion-exclusion separation, all of which have similar principles; for simplicity, only procedures based on ion-exchange are referred to in this Standard. This Standard includes a summary of instrument testing procedures to ensure correct calibration and operation of the instrument.

1.2 PRINCIPLES OF ION CHROMATOGRAPHY. Anions and cations present in aqueous solution are separated, detected and quantified by means of high-performance ion-exchange chromatographic techniques.

The sample is injected into the ion chromatograph. An ionic eluent moves the sample through the analytical column, which is packed with a low capacity cation- or anion-exchanger. The sample ions are separated according to their affinities for the ion-exchange sites. Upon elution from the column, the ions are monitored by an appropriate detector. Changes in the detector response are recorded by a strip chart recorder, integrator or computer. The ions are identified by their retention times, and the ion concentration is determined by measuring the peak height or peak area and comparing it to a calibration curve prepared from calibration standards.

1.3 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

AS	
2162	Code of practice for the use of volumetric glassware
2850	Chemical analysis—Interlaboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct
ASTM	
D 1193	Specification for reagent water