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General rules for ion selective electrode method

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Descriptors : ionization, iodometry, instructions for use, ions, concentration (chemical), determination of content

Reference number : **JIS K 0122 : 1997 (E)**

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

General rules for ion selective electrode method

1 Scope This Japanese Industrial Standard specifies the general matters according to which the ion concentration of organic substance or inorganic substance is measured using an ion selective electrode. Provided that this shall not be applicable to pH measurement.

Remarks 1 The normative references to this Standard are listed in Attached Table 1.

2 The unit dm^3 used in this Standard equals to l, and cm^3 to ml.

2 Generals in common Generals in common shall conform to **JIS K 0050**.

3 Definitions For the purpose of this Standard, the definitions in **JIS K 0211**, **JIS K 0213**, and **JIS K 0215** apply, and the rest of the terms are as follows.

(1) **ion selective electrode** Electrode generating electric potential in response to the activity of special ion in solution.

(2) **activity** A sort of thermodynamic mass-molar concentration which is given with relation to chemical potential of a chemical species.

(3) **activity coefficient** This is a ratio of the activity of a chemical species to the concentration, and is the measure by which the deviation of chemical species from the ideal behavior can be expressed.

(4) **ionic strength** The value given by the formula $1/2 \Sigma Z_M^2 C_M$, where, C_M is the molar concentration of ionic species M in solution, and Z_M is ionic charge number. Otherwise, the value similarly defined using mass molar concentration.

(5) **response potential** Electric potential measured on an ion selective electrode when a reference electrode is set as a counter electrode.

(6) **response slope** The electric potential (mV/concentration difference by ten times) measured when the concentration ratio between two reference solutions.

(7) **response time** Duration necessary until response potential will get defined indicated value that is stable.

(8) **selectivity coefficient** The value achieved experimentally which expresses the degree of influence given to the target ion for measurement by coexisting ion.

(9) **membrane electrode** The electrode system composed of various selective membrane and the electrode installed inside selective membrane.

Remarks In many cases, the membrane electrode is installed by setting an internal reference electrode and electrolyte solution inside selective membrane.

(10) **glass membrane electrode** Ion sensitive electrode of which sensitive membrane is composed of such glass membrane as Na_2O-Al_2O_3-SiO_2 system or Li_2O-Al_2O_3-SiO_2 system.

(11) **solid-state membrane electrode** Ion selective electrode of which selective membrane is composed of single crystal of hardly-soluble metal salt or of the membrane that was shaped by moulding with pressure the powder mainly made of hardly-soluble