

# ISO 21438-2:2024-01 (E)

## Workplace atmospheres - Determination of inorganic acids by ion chromatography - Part 2: Volatile acids, except hydrofluoric acid (hydrochloric acid, hydrobromic acid and nitric acid)

---

### Contents

Page

<b>Foreword</b>	<b>v</b>
<b>Introduction</b>	<b>vi</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>2</b>
<b>4 Principle</b>	<b>3</b>
<b>5 Requirement</b>	<b>3</b>
<b>6 Reagents</b>	<b>3</b>
<b>7 Apparatus</b>	<b>4</b>
7.1 Sampling equipment	4
7.2 Laboratory apparatus	5
<b>8 Occupational exposure assessment</b>	<b>6</b>
<b>9 Sampling</b>	<b>7</b>
9.1 Preliminary considerations	7
9.1.1 Selection and use of samplers	7
9.1.2 Sampling period	7
9.1.3 Effect of temperature and pressure on flow rate measurements	8
9.1.4 Sample handling	8
9.2 Preparation for sampling	8
9.2.1 Cleaning of samplers	8
9.2.2 Loading the aerosol samplers with filters	8
9.2.3 Setting the volumetric flow rate	9
9.2.4 Field blanks	9
9.3 Sampling position	9
9.3.1 Personal sampling	9
9.3.2 Static sampling	9
9.4 Collection of samples	9
9.5 Transportation	10
9.5.1 Samplers that collect airborne particles and/or gases on the filter	10
9.5.2 Samplers with an internal filter cassette	10
9.5.3 Samplers of the disposable-cassette type	10
9.5.4 Transport of samples to the laboratory	10
9.5.5 Equilibration period	10
<b>10 Analysis</b>	<b>10</b>
10.1 Preparation of test and calibration solutions, and filter samples	11
10.1.1 General	11
10.1.2 Preparation of filter solutions	11
10.1.3 Preparation of calibration solutions	11
10.2 Instrumental analysis	11
10.3 Estimation of limits of detection and quantification	12
10.3.1 Estimation of the instrumental limit of detection	12
10.3.2 Estimation of the method limit of detection and limit of quantification	12
10.4 Quality control	12

10.4.1	Reagent blanks and laboratory blanks.....	12
10.4.2	Quality control solutions.....	12
10.4.3	Certified reference materials.....	13
10.4.4	Proficiency testing.....	13
10.5	Measurement uncertainty.....	13
<b>11</b>	<b>Expression of results.....</b>	<b>13</b>
<b>12</b>	<b>Method performance.....</b>	<b>14</b>
12.1	Sampling efficiency and sample storage.....	14
12.2	Limits of quantification.....	14
12.3	Upper limits of the working range.....	14
12.4	Bias and precision.....	14
12.4.1	Analytical bias.....	14
12.4.2	Analytical precision.....	15
12.5	Uncertainty of sampling and analysis method.....	15
12.6	Interferences .....	15
<b>13</b>	<b>Test report.....</b>	<b>15</b>
13.1	Test record.....	15
13.2	Laboratory report.....	16
<b>Annex A (normative) Temperature and pressure correction</b> .....		<b>17</b>
<b>Annex B (informative) Filter materials</b> .....		<b>19</b>
<b>Bibliography</b> .....		<b>20</b>