

# Ion Chromatography (IC) Standards

These standards are prepared, tested, certified and verified by following the exact same regime as already presented for ICP-MS Standards. The raw material specifications are in most cases identical to the materials used for ICP-MS. All of these standards are verified by IC. Additionally, the elemental anions and cations are also analysed by ICP-MS. All results are verified on a state of the art Ion Chromatograph, which is calibrated using high purity ISO Guide 34 accredited standards, similar in concentration to the products listed below.

## Anion Standards

Product No.	Ion	Starting Material	Matrix	Concentration	Pack size
<b>Acetate</b>					
ICAU35	CH <sub>3</sub> COO-	Sodium Acetate	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS35	CH <sub>3</sub> COO-	Sodium Acetate	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB35	CH <sub>3</sub> COO-	Sodium Acetate	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Bromide</b>					
ICAU01	Br-	KBr	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS01	Br-	KBr	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB01	Br-	KBr	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Carbonate</b>					
ICAU22	CO <sub>3</sub> <sup>2-</sup>	KClO2	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS22	CO <sub>3</sub> <sup>2-</sup>	KClO2	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB22	CO <sub>3</sub> <sup>2-</sup>	KClO2	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Chloride</b>					
ICAU02	Cl-	KCl	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS02	Cl-	KCl	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB02	Cl-	KCl	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Chromate</b>					
ICAU29	CrO <sub>4</sub> <sup>2-</sup>	NH <sub>4</sub> Cr <sub>2</sub> O <sub>7</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS29	CrO <sub>4</sub> <sup>2-</sup>	NH <sub>4</sub> Cr <sub>2</sub> O <sub>7</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB29	CrO <sub>4</sub> <sup>2-</sup>	NH <sub>4</sub> Cr <sub>2</sub> O <sub>7</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Cyanide</b>					
ICAU08	CN-	NaCN	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS08	CN-	NaCN	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB08	CN-	NaCN	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Fluoride</b>					
ICAU03	F-	NaF 99.99	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS03	F-	NaF 99.99	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB03	F-	NaF 99.99	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml

Product No.	Ion	Starting Material	Matrix	Concentration	Pack size
<b>Formate</b>					
ICAU34	HCOO <sup>-</sup>	Sodium Formate	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS34	HCOO <sup>-</sup>	Sodium Formate	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB34	HCOO <sup>-</sup>	Sodium Formate	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Iodide</b>					
ICAU40	I <sup>-</sup>	NH <sub>4</sub> I	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS40	I <sup>-</sup>	NH <sub>4</sub> I	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB40	I <sup>-</sup>	NH <sub>4</sub> I	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Nitrate</b>					
ICAU04	NO <sub>3</sub> <sup>-</sup>	NH <sub>4</sub> NO <sub>3</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS04	NO <sub>3</sub> <sup>-</sup>	NH <sub>4</sub> NO <sub>3</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB04	NO <sub>3</sub> <sup>-</sup>	NH <sub>4</sub> NO <sub>3</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Nitrite</b>					
ICAU11	NO <sub>2</sub> <sup>-</sup>	NaNO <sub>2</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS11	NO <sub>2</sub> <sup>-</sup>	NaNO <sub>2</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB11	NO <sub>2</sub> <sup>-</sup>	NaNO <sub>2</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Oxalate</b>					
ICAU13	(COO) <sub>2</sub> <sup>2-</sup>	K <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS13	(COO) <sub>2</sub> <sup>2-</sup>	K <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB13	(COO) <sub>2</sub> <sup>2-</sup>	K <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Phosphate</b>					
ICAU05	PO <sub>4</sub> <sup>3-</sup>	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS05	PO <sub>4</sub> <sup>3-</sup>	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB05	PO <sub>4</sub> <sup>3-</sup>	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Silica</b>					
ICAU12	SiO <sub>2</sub>	Na <sub>2</sub> O <sub>3</sub> Si	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS12	SiO <sub>2</sub>	Na <sub>2</sub> O <sub>3</sub> Si	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB12	SiO <sub>2</sub>	Na <sub>2</sub> O <sub>3</sub> Si	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Sulphate</b>					
ICAU06	SO <sub>4</sub> <sup>2-</sup>	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS06	SO <sub>4</sub> <sup>2-</sup>	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB06	SO <sub>4</sub> <sup>2-</sup>	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Tartrate</b>					
ICAU36	(CHOH) <sub>2</sub> (COO) <sub>2</sub> <sup>2-</sup>	Tartaric Acid	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICAS36	(CHOH) <sub>2</sub> (COO) <sub>2</sub> <sup>2-</sup>	Tartaric Acid	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICAB36	(CHOH) <sub>2</sub> (COO) <sub>2</sub> <sup>2-</sup>	Tartaric Acid	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml

## Cation Standards

<b>Aluminium</b>					
ICCU06	Al <sup>4+</sup>	Al(NO <sub>3</sub> ) <sub>3</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICCS06	Al <sup>4+</sup>	Al(NO <sub>3</sub> ) <sub>3</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICCB06	Al <sup>4+</sup>	Al(NO <sub>3</sub> ) <sub>3</sub>	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml
<b>Ammonium</b>					
ICCU01	NH <sub>4</sub> <sup>+</sup>	NH <sub>4</sub> Cl	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICCS01	NH <sub>4</sub> <sup>+</sup>	NH <sub>4</sub> Cl	H <sub>2</sub> O	1mg/ml (1,000ppm)	100ml
ICCB01	NH <sub>4</sub> <sup>+</sup>	NH <sub>4</sub> Cl	H <sub>2</sub> O	1mg/ml (1,000ppm)	500ml

Product No.	Ion	Starting Material	Matrix	Concentration	Pack size
<b>Barium</b>					
ICCU44	Ba <sup>2+</sup>	Ba(NO <sub>3</sub> ) <sub>2</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICCS44	Ba <sup>2+</sup>	Ba(NO <sub>3</sub> ) <sub>2</sub>	H <sub>2</sub> O	1mg/m l (1,000ppm)	100ml
ICCB44	Ba <sup>2+</sup>	Ba(NO <sub>3</sub> ) <sub>2</sub>	H <sub>2</sub> O	1mg/m l (1,000ppm)	500ml
<b>Cadmium</b>					
ICCU09	Cd <sup>+</sup>	Cd Metal	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS09	Cd <sup>+</sup>	Cd Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB09	Cd <sup>+</sup>	Cd Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Calcium</b>					
ICCU08	Ca <sup>2+</sup>	Ca(NO <sub>3</sub> ) <sub>2</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICCS08	Ca <sup>2+</sup>	Ca(NO <sub>3</sub> ) <sub>2</sub>	H <sub>2</sub> O	1mg/m l (1,000ppm)	100ml
ICCB08	Ca <sup>2+</sup>	Ca(NO <sub>3</sub> ) <sub>2</sub>	H <sub>2</sub> O	1mg/m l (1,000ppm)	500ml
<b>Cesium</b>					
ICCU91	Cs <sup>+</sup>	CsNO <sub>3</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICCS91	Cs <sup>+</sup>	CsNO <sub>3</sub>	H <sub>2</sub> O	1mg/m l (1,000ppm)	100ml
ICCB91	Cs <sup>+</sup>	CsNO <sub>3</sub>	H <sub>2</sub> O	1mg/m l (1,000ppm)	500ml
<b>Cobalt</b>					
ICCU15	Co <sup>2+</sup>	Co Metal	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS15	Co <sup>2+</sup>	Co Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB15	Co <sup>2+</sup>	Co Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Copper</b>					
ICCU16	Cu <sup>+</sup>	Cu Metal	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS16	Cu <sup>+</sup>	Cu Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB16	Cu <sup>+</sup>	Cu Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Iron</b>					
ICCU12	Fe <sup>2+</sup>	Fe(NO <sub>3</sub> ) <sub>3</sub>	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS12	Fe <sup>2+</sup>	Fe(NO <sub>3</sub> ) <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB12	Fe <sup>2+</sup>	Fe(NO <sub>3</sub> ) <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Lead</b>					
ICCU19	Pb <sup>+</sup>	PbNO <sub>2</sub>	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS19	Pb <sup>+</sup>	PbNO <sub>2</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB19	Pb <sup>+</sup>	PbNO <sub>2</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Lithium</b>					
ICCU02	Li <sup>+</sup>	LiNO <sub>3</sub>	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS02	Li <sup>+</sup>	LiNO <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB02	Li <sup>+</sup>	LiNO <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Magnesium</b>					
ICCU07	Mg <sup>2+</sup>	Mg(NO <sub>3</sub> ) <sub>2</sub>	H <sub>2</sub> O	0.1mg/ml (100ppm)	100ml
ICCS07	Mg <sup>2+</sup>	Mg(NO <sub>3</sub> ) <sub>2</sub>	H <sub>2</sub> O	1mg/m l (1,000ppm)	100ml
ICCB07	Mg <sup>2+</sup>	Mg(NO <sub>3</sub> ) <sub>2</sub>	H <sub>2</sub> O	1mg/m l (1,000ppm)	500ml
<b>Manganese</b>					
ICCU11	Mn <sup>2+</sup>	Mn	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS11	Mn <sup>2+</sup>	Mn	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB11	Mn <sup>2+</sup>	Mn	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Nickel</b>					
ICCU14	Ni <sup>2+</sup>	Ni Metal	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS14	Ni <sup>2+</sup>	Ni Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB14	Ni <sup>2+</sup>	Ni Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml



Product No.	Ion	Starting Material	Matrix	Concentration	Pack size
<b>Potassium</b>					
ICCU03	K <sup>+</sup>	KNO <sub>3</sub>	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS03	K <sup>+</sup>	KNO <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB03	K <sup>+</sup>	KNO <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Rubidium</b>					
ICCU92	Rb <sup>+</sup>	RbNO <sub>3</sub>	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS92	Rb <sup>+</sup>	RbNO <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB92	Rb <sup>+</sup>	RbNO <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Sodium</b>					
ICCU04	Na <sup>+</sup>	NaNO <sub>3</sub>	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS04	Na <sup>+</sup>	NaNO <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB04	Na <sup>+</sup>	NaNO <sub>3</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Strontium</b>					
ICCU43	Sr <sup>2+</sup>	Sr(NO <sub>3</sub> ) <sub>2</sub>	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS43	Sr <sup>2+</sup>	Sr(NO <sub>3</sub> ) <sub>2</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB43	Sr <sup>2+</sup>	Sr(NO <sub>3</sub> ) <sub>2</sub>	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml
<b>Zinc</b>					
ICCU33	Zn <sup>2+</sup>	Zn Metal	0.005% HNO <sub>3</sub>	0.1mg/ml (100ppm)	100ml
ICCS33	Zn <sup>2+</sup>	Zn Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	100ml
ICCB33	Zn <sup>2+</sup>	Zn Metal	0.005% HNO <sub>3</sub>	1mg/m l (1,000ppm)	500ml

## IC Mixed Standards

Product No.	Elements	Conc µg/ml	Matrix	Pack size
<b>Combined Five Anion Standard</b>				
ICA-DX-51	Fl	20	H <sub>2</sub> O	100ml
	Cl	30		
	NO <sub>3</sub>	100		
	PO <sub>4</sub>	150		
	SO <sub>4</sub>	150		
<b>Combined Six Cation Standard</b>				
ICC-DX-611	Ca	1000	H <sub>2</sub> O	100ml
	NH <sub>4</sub>	400		
	Na	200		
	K	200		
	Mg	200		
	Li	50		
<b>Combined Six Cation Standard</b>				
ICC-DX-621	Li	50	H <sub>2</sub> O	100ml
	Na	200		
	NH <sub>4</sub>	250		
	Mg	250		
	Ca	500		
	K	500		
<b>Combined Seven Anion Standard</b>				
ICA-DX-711	Fl	20	H <sub>2</sub> O	100ml
	Cl	30		
	Br	100		
	NO <sub>2</sub>	100		
	NO <sub>3</sub>	100		
	PO <sub>4</sub>	150		
	SO <sub>4</sub>	150		
<b>Combined Seven Anion Standard</b>				
ICA-DX-721	PO <sub>4</sub>	200	H <sub>2</sub> O	100ml
	Cl	100		
	Br	100		
	NO <sub>2</sub>	100		
	NO <sub>3</sub>	100		
	SO <sub>4</sub>	100		
	Fl	20		

Product No.	Elements	Conc µg/ml	Matrix	Pack size
<b>Multi Anion Standard</b>				
ICA-LIS-601	FI	50	H <sub>2</sub> O	100ml
	Cl	1000		
	Br	100		
	NO <sub>2</sub>	20		
	NO <sub>3</sub> as N	200		
	PO <sub>4</sub> as P	15		
	SO <sub>4</sub>	5000		
<b>Mixed Anion Standard</b>				
ICA-BMS-65	NO <sub>3</sub>	200	H <sub>2</sub> O	500ml
	SO <sub>4</sub>	200		
	PO <sub>4</sub>	200		
	Br	100		
	FI	100		
	Cl	100		
<b>Mixed Standard Solution</b>				
ICA-TG-35	PO <sub>4</sub> as P	100	H <sub>2</sub> O	500ml
	NH <sub>4</sub> as N	1000		
	NO <sub>3</sub> as N	1000		
<b>Mixed Standard Solution</b>				
ICA-TG-45	PO <sub>4</sub> as P	10	H <sub>2</sub> O	500ml
	NO <sub>3</sub> as N	300		
	NH <sub>4</sub> as N	150		
	Cl	3000		
<b>IC Multi Element Standard</b>				
IC-NHS-3	Na	200	H <sub>2</sub> O / Tr. HNO <sub>3</sub>	100ml
	K	10		
	Mg	2		
<b>IC Multi Element Standard</b>				
IC-NHS-4	Na	100	H <sub>2</sub> O	100ml
	K	10		
	Mg	1		
	Ca	5		
<b>IC Multi Element Standard</b>				
IC-GLO-7-100	Cl	1000	H <sub>2</sub> O	100ml
	SO <sub>4</sub>	1000		
	NO <sub>3</sub>	1000		
	Br	100		
	NO <sub>2</sub>	100		
	PO <sub>4</sub>	100		
	FI	100		
<b>IC Multi Element Standard</b>				
IC-SYN-7	Cl	100	H <sub>2</sub> O	200ml
	Br	100		
	NO <sub>2</sub>	100		
	NO <sub>3</sub>	100		
	SO <sub>4</sub>	100		
	FI	20		
	PO <sub>4</sub>	200		