

Code	Product	Unit
NIST-918B	Potassium chloride This material is intended for use as an analytical standard of known purity. It is intended primarily for use in the calibration and standardization of procedures for potassium (K) and chloride (Cl) determinations employed in clinical analysis and for routine critical evaluation of the daily working standards used in these procedures. The certified values for this material are expressed as % mass fractions Certified value KCl 99.927 ± 0.014 % K 52.4121 ± 0.0086 % Cl 47.5284 ± 0.0049 %	30 g

NIST-919B	Sodium chloride This material is intended for the production of saline solutions of accurately known concentration and the calibration of instrumentation and standardization of procedures used in the determination of sodium and chloride ions in clinical analysis. A unit consists of a single glass bottle containing 30 g of the material. The certified values are expressed as % mass fractions. Certified value NaCl 99.835 % ± 0.020 % Cl 60.564 % ± 0.014 % Na 39.2747% ± 0.0075%	30 g
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Electrolytes in serum

BCR-304	Calcium (II), Magnesium (II) and Lithium (I) in human serum Each sample is in lyophilised form equivalent to about 5.3 mL of human serum kept under vacuum in rubber stoppered vials. Amount-of-substance concentration in the reconstituted material Analytes mmol/L Ca 2.201 ± 0.019 Mg 1.85 ± 0.03 Li 0.985 ± 0.029	vial
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HEC JCCRM111	Chloride in human serum This material is prepared following NCCLS C29A2 standardization of sodium and potassium ion-selective electrode systems to the flame photometric reference method. Certified values (amount-of-substance concentration) in the range 6.7 to 120.1 mmol/l with corresponding uncertainties of 0.9 to 1.2 mmol/l.	unit
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NIST-956B	Electrolytes in frozen human serum This material is primarily intended for use in the calibration and validation of procedures and methods employed in clinical analysis for the determination of electrolytes in either diluted or undiluted human serum or plasma. It can be used for calibrating direct-reading ion-selective electrode analyzers [1] and for validating secondary reference materials. A unit consists of six sealed ampoules of frozen human serum, two ampoules each of three different concentration levels. Each ampoule contains approximately 2.0 mL of human serum. Certified values for elements at three levels. Analytes level 1 level 2 level 3 mmol/L mmol/L mmol/L Ca 2.949 2.456 1.974 Li 1.920 1.207 0.486 Mg 1.522 0.994 0.458 K 5.973 3.983 1.987 Na 120.1 141.0 160.7	set (6)
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NIST-909B	Human serum This material is primarily intended for use in evaluating the accuracy of clinical procedures for determination of specified constituents in human serum. It can also be used to validate working or secondary reference materials. A unit consists of six bottles of lyophilised human serum, three bottles each of two different analyte concentration levels and six bottles of deionised, autoclaved water for reconstitution. Certified values for trace metals and other clinical analytes; cholesterol, urea etc. are given in both mmol/L and mmol/L/g. Analytes Level 1 Level 2 mmol/L mmol/L Calcium 2.218 3.532 Chloride 89.11 119.43 Cholesterol 3.787 6.084 Creatinine 0.05618 0.4674 Lithium 0.6145 2.600 Magnesium 0.7634 1.918 Potassium 3.424 6.278 Sodium 120.76 141.0 Total glycerides 0.949 1.529 Triglycerides 0.804 1.271 Urea 5.51 30.75 Uric acid 0.2809 0.7579 Uncertified (information) values ALP 86 410 U/L LDH 145 480 U/L ALT 49 150 U/L AST 43 200 U/L CK 92 300 U/L pH 7.9 at 22.6 °C 7.8 at 22.9 °C	set (6x10 mL)
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Code	Product	Unit															
Non-electrolyte metals in blood																	
NIST-955C	<p>Lead in caprine blood</p> <p>This material is intended primarily for use in evaluating the accuracy of lead concentration determinations in blood and for use in validating working or secondary reference materials for lead in blood analysis. A unit consists of four vials of frozen caprine blood at four concentration levels: a base level and three progressively elevated levels that contain endogenous lead and spiked inorganic arsenic, cadmium, inorganic mercury, methylmercury, and ethylmercury. Certified values are provided for lead. Each vial contains approximately 2 mL of whole blood.</p> <table border="1"> <thead> <tr> <th>Certified concentration</th> <th>Lead (µg/dL)</th> <th>Lead (µmol/L)</th> </tr> </thead> <tbody> <tr> <td>Level 1</td> <td>0.424 ± 0.011</td> <td>0.02047 ± 0.00053</td> </tr> <tr> <td>Level 2</td> <td>13.950 ± 0.080</td> <td>0.6733 ± 0.0038</td> </tr> <tr> <td>Level 3</td> <td>27.76 ± 0.16</td> <td>1.3400 ± 0.0076</td> </tr> <tr> <td>Level 4</td> <td>45.53 ± 0.27</td> <td>2.198 ± 0.013</td> </tr> </tbody> </table>	Certified concentration	Lead (µg/dL)	Lead (µmol/L)	Level 1	0.424 ± 0.011	0.02047 ± 0.00053	Level 2	13.950 ± 0.080	0.6733 ± 0.0038	Level 3	27.76 ± 0.16	1.3400 ± 0.0076	Level 4	45.53 ± 0.27	2.198 ± 0.013	set (4 x 2 mL)
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ERM-CE194	<p>Lead and cadmium in bovine blood, low level</p> <p>Each sample is in lyophilised form equivalent to about 5.75 mL of bovine blood with additives, kept under nitrogen in rubber stoppered vials. Mass concentration in the reconstituted material</p> <p>Analytes</p> <table border="1"> <tbody> <tr> <td>Pb</td> <td>126 ± 4 µg/L</td> </tr> <tr> <td>Cd</td> <td>0.20 ± 0.05 µg/L</td> </tr> </tbody> </table>	Pb	126 ± 4 µg/L	Cd	0.20 ± 0.05 µg/L	amp.											
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BCR-634	<p>Lead and cadmium in reconstituted human blood (low)</p> <p>The material is supplied in lyophilised form in brown glass vials. Sodium-EDTA was used as anticoagulant. No other preservatives were added. The content of a vial is approximately 0.6 g dry matter with residual moisture content less than 2 % and equivalent to 3.0 mL of fresh whole blood. This material was produced from blood from healthy Danish blood donors. Each portion of blood was tested negative for Anti-HIV-1&2, Anti-HCV and Anti-HTLV-I&II. However, as all biological material of human origin the blood should be treated as contagious material.</p> <p>Analytes mass concentration</p> <table border="1"> <tbody> <tr> <td>Cd</td> <td>1.4 µg/L</td> </tr> <tr> <td>Pb</td> <td>46 µg/L</td> </tr> </tbody> </table>	Cd	1.4 µg/L	Pb	46 µg/L	vial											
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BCR-635	<p>Lead and cadmium in reconstituted human blood (medium)</p> <p>The material is supplied in lyophilised form in brown glass vials. Sodium-EDTA was used as anticoagulant. No other preservatives were added. The content of a vial is approximately 0.6 g dry matter with residual moisture content less than 2 % and equivalent to 3.0 mL of fresh whole blood. This material was produced from blood from healthy Danish blood donors. Each portion of blood was tested negative for Anti-HIV-1&2, Anti-HCV and Anti-HTLV-I&II. However, as all biological material of human origin the blood should be treated as contagious material.</p> <p>Analytes mass concentration</p> <table border="1"> <tbody> <tr> <td>Cd</td> <td>6.6 µg/L</td> </tr> <tr> <td>Pb</td> <td>210 µg/L</td> </tr> </tbody> </table>	Cd	6.6 µg/L	Pb	210 µg/L	vial											
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BCR-636	<p>Lead and cadmium in reconstituted human blood (high)</p> <p>The material is supplied in lyophilised form in brown glass vials. Sodium-EDTA was used as anticoagulant. No other preservatives were added. The content of a vial is approximately 0.6 g dry matter with residual moisture content less than 2 % and equivalent to 3.0 mL of fresh whole blood. This material was produced from blood from healthy Danish blood donors. Each portion of blood was tested negative for Anti-HIV-1&2, Anti-HCV and Anti-HTLV-I&II. However, as all biological material of human origin the blood should be treated as contagious material.</p> <p>Analytes mass concentration</p> <table border="1"> <tbody> <tr> <td>Cd</td> <td>11.6 µg/L</td> </tr> <tr> <td>Pb</td> <td>0.52 · 10³ µg/L</td> </tr> </tbody> </table>	Cd	11.6 µg/L	Pb	0.52 · 10 ³ µg/L	vial											
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NIST-966	<p>Toxic metals in blood</p> <p>This material is intended for use in evaluating the accuracy of lead, cadmium and total mercury concentration determinations in whole blood. It can also be used for validating analytical methods and for providing traceability to working or secondary blood reference materials containing these constituents. It contains frozen whole bovine blood with below mentioned components at two concentration levels.</p> <table border="1"> <thead> <tr> <th>Analytes</th> <th>level 1</th> <th>level 2</th> </tr> </thead> <tbody> <tr> <td>Pb</td> <td>1.56</td> <td>25.27 µg/dL</td> </tr> <tr> <td>Cd</td> <td>0.032</td> <td>5.22 µg/L</td> </tr> <tr> <td>Hg (total)</td> <td>0.0445</td> <td>31.4 µg/L</td> </tr> </tbody> </table>	Analytes	level 1	level 2	Pb	1.56	25.27 µg/dL	Cd	0.032	5.22 µg/L	Hg (total)	0.0445	31.4 µg/L	unit			
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Clinical applications

Code	Product	Unit
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Non-electrolyte metals in urine

NIST-2672A	Mercury in urine	set (4)
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This material is intended primarily for use as an analytical standard for the determination of mercury in urine. It consists of four bottles of freeze-dried urine containing mercury, two bottles each at low and elevated levels.

Certified values after reconstitution

	low level	elevated level
Hg	(0.002)	0.105 mg/L

NIST-2670A	Toxic elements in freeze dried urine	set (4 x 20 mL)
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This material is primarily intended for use in evaluating the accuracy of clinical methods and for the calibration of apparatus used to determine the concentration of toxic metals and other elements in human urine or similar matrices. It can also be used to validate working or secondary reference materials. It consists of four bottles of freeze-dried urine, two bottles each at the low and high levels. The low level urine was prepared from human urine that was lyophilised after pooling and centrifugation. The high level urine was prepared by spiking an aliquot of the pooled and homogenized low-level urine with selected metals, followed by lyophilisation. Due to the centrifugation (which improved sample homogeneity), neither level represents a fresh urine pool from a normal human population.

Analytes	low	elevated level
Antimony	0.971	0.824 µg/L
Cadmium	0.0591	4.862 µg/L
Cesium	1.075	1.085 µg/L
Cobalt	0.166	51.2 µg/L
Iodine	88.2	88.2 µg/L
Lead	0.49	233.2 µg/L
Mercury	0.0663	95.1 µg/L
Manganese		99 µg/L
Molybdenum		114.1 µg/L
Platinum		51.5 µg/L
Selenium		229.5 µg/L
Thallium	0.0162	5.417 µg/L
Thorium	0.0053	0.01606 µg/L
Uranium	0.1020	4.997 µg/L

Non-peptide hormones

NIST-921	Cortisol (hydrocortisone)	1 g
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This material is intended primarily for use in the calibration and standardisation of procedures for cortisol determinations employed in clinical analysis and for routine evaluation of the daily working standards used in these procedures.

Analyte

Cortisol (hydrocortisone)	98.9 ± 0.2 %
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IRMM-468	Thyroxine (T4)	vial
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The material can be used as a calibrant by manufacturers and laboratories, e.g. for the preparation of lower order reference materials and for validation studies.

The material consists of an off-white crystalline powder in an amber glass vial sealed under N₂ atmosphere. Each vial contains about 100 mg of the powder.

Certified value (mass fraction)	98.6 ± 0.7 %
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IRMM-469	3,3',5 Triiodothyronine (T3)	vial
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The material can be used as a calibrant by manufacturers and laboratories, e.g. for the preparation of lower order reference materials and for validation studies.

The material consists of an off-white crystalline powder in an amber glass vial sealed under N₂ atmosphere. Each vial contains about 100 mg of the powder.

Certified value (mass fraction)	91.1 ± 0.7 %
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Non-peptide hormones in serum

ERM-DA192	Cortisol in human serum (unspiked)	amp.
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Each sample is the lyophilised form of a 1.25 mL portion of serum without additives kept under nitrogen in sealed glass ampoules. Cortisol concentration in the reconstituted material

µg/L	98.8 ± 2.0
nmol/L	273 ± 6

ERM-DA193	Cortisol in human serum (spiked)	amp.
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Each sample is the lyophilised form of a 1.25 mL portion of serum without additives kept under nitrogen in sealed glass ampoules. Cortisol concentration in the reconstituted material

µg/L	277 ± 5
nmol/L	763 ± 14

Code	Product	Unit																																																																								
SERO102405	Trace elements in whole blood, level 3 These reference materials are produced from blood collected from thoroughly controlled voluntary blood donors of a Scandinavian blood bank. Each unit is separately controlled and found negative for HBS antigen and HIV I, II and hepatitis C antibodies. No preservatives are added to the samples. It contains all normal constituents which ensures the control and test samples to be analysed under the same conditions. Certified values after reconstitution	10 x 5 mL																																																																								
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Occupational health and hygiene materials in serum

ME 28341	Metals in human serum level 1 (low) Lyophilised human serum control (Medisafe® Metals S) in two different concentrations for quality control and calibration of trace element determinations from serum. The real assay values have been determined by independent laboratories of forensic medicine. Analytes	6 x 5 mL																		
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Clinical applications

Code	Product	Unit																																																																				
ME 28342	<p>Metals in human serum, level 2 (high)</p> <p>Lyophilised human serum control (Medisafe® Metals S) in two different concentrations for quality control and calibration of trace element determinations from serum. The real assay values have been determined by independent laboratories of forensic medicine.</p> <p>Analytes</p> <table border="0"> <tr> <td>Al.....</td> <td>40 µg/L</td> <td>Cu.....</td> <td>1500 µg/L</td> <td>Pb.....</td> <td>293 µg/L</td> </tr> <tr> <td>As.....</td> <td>250 µg/L</td> <td>F.....</td> <td>400 µg/L</td> <td>Pd.....</td> <td>55 µg/L</td> </tr> <tr> <td>Ba.....</td> <td>44 µg/L</td> <td>Fe.....</td> <td>1690 µg/L</td> <td>Se.....</td> <td>90 µg/L</td> </tr> <tr> <td>Cd.....</td> <td>17 µg/L</td> <td>Hg.....</td> <td>50 µg/L</td> <td>Sn.....</td> <td>50 µg/L</td> </tr> <tr> <td>Cr.....</td> <td>14 µg/L</td> <td>Mn.....</td> <td>20 µg/L</td> <td>Zn.....</td> <td>520 µg/L</td> </tr> <tr> <td>Co.....</td> <td>12 µg/L</td> <td>Ni.....</td> <td>51 µg/L</td> <td></td> <td></td> </tr> </table>	Al.....	40 µg/L	Cu.....	1500 µg/L	Pb.....	293 µg/L	As.....	250 µg/L	F.....	400 µg/L	Pd.....	55 µg/L	Ba.....	44 µg/L	Fe.....	1690 µg/L	Se.....	90 µg/L	Cd.....	17 µg/L	Hg.....	50 µg/L	Sn.....	50 µg/L	Cr.....	14 µg/L	Mn.....	20 µg/L	Zn.....	520 µg/L	Co.....	12 µg/L	Ni.....	51 µg/L			6 x 5 mL																																
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NIST-1589A	<p>PCBs, pesticides and dioxins/furans in human serum</p> <p>This standard is intended for use in evaluating analytical methods for the determination of selected polychlorinated biphenyl (PCB) congeners, chlorinated pesticides and total cholesterol in human serum and similar matrices. Reference values are also provided for selected polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). All of the constituents for which certified and reference values are provided are naturally present in the freeze-dried human serum. A unit consists of five bottles of freeze-dried human serum.</p> <table border="0"> <tr> <td>Analyte</td> <td>ng/kg</td> <td></td> <td></td> </tr> <tr> <td>PCB 99.....</td> <td>121 ± 10</td> <td>PCB 151.....</td> <td>28 ± 4</td> </tr> <tr> <td>PCB 101.....</td> <td>34 ± 9</td> <td>PCB 153.....</td> <td>672 ± 35</td> </tr> <tr> <td>PCB 105.....</td> <td>29 ± 4</td> <td>PCB 156.....</td> <td>66 ± 4</td> </tr> <tr> <td>PCB 118.....</td> <td>119 ± 9</td> <td>PCB 180.....</td> <td>483 ± 29</td> </tr> <tr> <td>PCB 138.....</td> <td>483 ± 39</td> <td>PCB 183.....</td> <td>65 ± 5</td> </tr> <tr> <td>PCB 163.....</td> <td>--</td> <td>PCB 187.....</td> <td>172 ± 25</td> </tr> <tr> <td>PCB 164.....</td> <td>--</td> <td>PCB 182.....</td> <td>--</td> </tr> <tr> <td>PCB 149.....</td> <td>56 ± 8</td> <td>PCB 194.....</td> <td>98 ± 14</td> </tr> <tr> <td></td> <td></td> <td>PCB 195.....</td> <td>22 ± 4</td> </tr> <tr> <td></td> <td></td> <td>PCB 206.....</td> <td>40 ± 6</td> </tr> <tr> <td></td> <td></td> <td>PCB 209.....</td> <td>25 ± 4</td> </tr> <tr> <td></td> <td></td> <td>beta-HCH.....</td> <td>56 ± 13</td> </tr> <tr> <td></td> <td></td> <td>trans-Nonachlor.....</td> <td>169 ± 29</td> </tr> <tr> <td></td> <td></td> <td>Heptachlor epoxide.....</td> <td>75 ± 9</td> </tr> <tr> <td></td> <td></td> <td>Oxychlorodane.....</td> <td>157 ± 14</td> </tr> <tr> <td></td> <td></td> <td>4,4'-DDE.....</td> <td>6600 ± 1000</td> </tr> </table>	Analyte	ng/kg			PCB 99.....	121 ± 10	PCB 151.....	28 ± 4	PCB 101.....	34 ± 9	PCB 153.....	672 ± 35	PCB 105.....	29 ± 4	PCB 156.....	66 ± 4	PCB 118.....	119 ± 9	PCB 180.....	483 ± 29	PCB 138.....	483 ± 39	PCB 183.....	65 ± 5	PCB 163.....	--	PCB 187.....	172 ± 25	PCB 164.....	--	PCB 182.....	--	PCB 149.....	56 ± 8	PCB 194.....	98 ± 14			PCB 195.....	22 ± 4			PCB 206.....	40 ± 6			PCB 209.....	25 ± 4			beta-HCH.....	56 ± 13			trans-Nonachlor.....	169 ± 29			Heptachlor epoxide.....	75 ± 9			Oxychlorodane.....	157 ± 14			4,4'-DDE.....	6600 ± 1000	set
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Clinical applications

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ME 28351	<p>Metals in human urine, level 1 (low)</p> <p>Lyophilised human urine control in two different concentrations for quality control and calibration of trace element determinations from urine. The real assay values have been determined by independent laboratories of forensic medicine.</p> <p>Analyte level 1</p> <table border="0"> <tr> <td>Al.....</td> <td>80 µg/L</td> <td>Cu.....</td> <td>50 µg/L</td> <td>Pb.....</td> <td>130 µg/L</td> </tr> <tr> <td>As.....</td> <td>50 µg/L</td> <td>F.....</td> <td>10 mg/L</td> <td>Pd.....</td> <td>5 µg/L</td> </tr> <tr> <td>Ba.....</td> <td>21 µg/L</td> <td>Fe.....</td> <td>700 µg/L</td> <td>Se.....</td> <td>20 µg/L</td> </tr> <tr> <td>Cd.....</td> <td>13 µg/L</td> <td>Hg.....</td> <td>50 µg/L</td> <td>Sn.....</td> <td>5 µg/L</td> </tr> <tr> <td>Cr.....</td> <td>10 µg/L</td> <td>Mn.....</td> <td>25 µg/L</td> <td>Zn.....</td> <td>1.7 mg/L</td> </tr> <tr> <td>Co.....</td> <td>3 µg/L</td> <td>Ni.....</td> <td>25 µg/L</td> <td></td> <td></td> </tr> </table>	Al.....	80 µg/L	Cu.....	50 µg/L	Pb.....	130 µg/L	As.....	50 µg/L	F.....	10 mg/L	Pd.....	5 µg/L	Ba.....	21 µg/L	Fe.....	700 µg/L	Se.....	20 µg/L	Cd.....	13 µg/L	Hg.....	50 µg/L	Sn.....	5 µg/L	Cr.....	10 µg/L	Mn.....	25 µg/L	Zn.....	1.7 mg/L	Co.....	3 µg/L	Ni.....	25 µg/L			6 x 5 mL
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ME 28352	<p>Metals in human urine, level 2 (high)</p> <p>Lyophilised human urine control in two different concentrations for quality control and calibration of trace element determinations from urine. The real assay values have been determined by independent laboratories of forensic medicine.</p> <p>Analyte level 2</p> <table border="0"> <tr> <td>Al.....</td> <td>400 µg/L</td> <td>Cu.....</td> <td>250 µg/L</td> <td>Pb.....</td> <td>80 µg/L</td> </tr> <tr> <td>As.....</td> <td>250 µg/L</td> <td>F.....</td> <td>6 mg/L</td> <td>Pd.....</td> <td>50 µg/L</td> </tr> <tr> <td>Ba.....</td> <td>50 µg/L</td> <td>Fe.....</td> <td>200 µg/L</td> <td>Se.....</td> <td>200 µg/L</td> </tr> <tr> <td>Cd.....</td> <td>8 µg/L</td> <td>Hg.....</td> <td>10 µg/L</td> <td>Sn.....</td> <td>50 µg/L</td> </tr> <tr> <td>Cr.....</td> <td>2 µg/L</td> <td>Mn.....</td> <td>15 µg/L</td> <td>Zn.....</td> <td>0.8 mg/L</td> </tr> <tr> <td>Co.....</td> <td>18 µg/L</td> <td>Ni.....</td> <td>15 µg/L</td> <td></td> <td></td> </tr> </table>	Al.....	400 µg/L	Cu.....	250 µg/L	Pb.....	80 µg/L	As.....	250 µg/L	F.....	6 mg/L	Pd.....	50 µg/L	Ba.....	50 µg/L	Fe.....	200 µg/L	Se.....	200 µg/L	Cd.....	8 µg/L	Hg.....	10 µg/L	Sn.....	50 µg/L	Cr.....	2 µg/L	Mn.....	15 µg/L	Zn.....	0.8 mg/L	Co.....	18 µg/L	Ni.....	15 µg/L			6 x 5 mL
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BCR-640	<p>Trace elements (As, Cr) and 1-Hydroxypyrene in lyophilised human urine</p> <p>The CRM is supplied in lyophilised form in white plastic vials. No other preservatives are added. The content of a vial is approximately 0.3 g dry matter with residual moisture content less than 3 % and equivalent to 10.0 mL of fresh urine. This urine material was collected from healthy British donors. Based on the available information and knowledge, any infection danger resulting from an exposure to the material can be excluded, because of the treatment process applied.</p> <table border="0"> <tr> <td>Compound</td> <td>concentration</td> </tr> <tr> <td>Arsenic.....</td> <td>23 µg/L</td> </tr> <tr> <td>Chromium.....</td> <td>1.5 µg/L</td> </tr> <tr> <td>1-Hydroxypyrene.....</td> <td>0.62 nmol/L</td> </tr> </table> <p>This product is currently under recertification - not available at the moment</p>	Compound	concentration	Arsenic.....	23 µg/L	Chromium.....	1.5 µg/L	1-Hydroxypyrene.....	0.62 nmol/L	vial																												
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BCR-642	<p>Trace elements (As, Cd, Cr, Co) and 1-Hydroxypyrene in lyophilised human urine</p> <p>The CRM is supplied in lyophilised form in white plastic vials. No other preservatives are added. The content of a vial is approximately 0.3 g dry matter with residual moisture content less than 3 % and equivalent to 10.0 mL of fresh urine. This urine material was collected from healthy British donors. Based on the available information and knowledge, any infection danger resulting from an exposure to the material can be excluded, because of the treatment process applied.</p> <table border="0"> <tr> <td>Compound</td> <td>concentration</td> </tr> <tr> <td>Arsenic.....</td> <td>157 µg/L</td> </tr> <tr> <td>Cadmium.....</td> <td>10.1 µg/L</td> </tr> <tr> <td>Chromium.....</td> <td>21.0 µg/L</td> </tr> <tr> <td>Cobalt.....</td> <td>61 µg/L</td> </tr> <tr> <td>1-Hydroxypyrene.....</td> <td>21 nmol/L</td> </tr> </table> <p>This product is currently under recertification - not available at the moment</p>	Compound	concentration	Arsenic.....	157 µg/L	Cadmium.....	10.1 µg/L	Chromium.....	21.0 µg/L	Cobalt.....	61 µg/L	1-Hydroxypyrene.....	21 nmol/L	vial																								
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NIST-2670A	Toxic elements in freeze dried urine This material is primarily intended for use in evaluating the accuracy of clinical methods and for the calibration of apparatus used to determine the concentration of toxic metals and other elements in human urine or similar matrices. It can also be used to validate working or secondary reference materials. It consists of four bottles of freeze-dried urine, two bottles each at the low and high levels. The low level urine was prepared from human urine that was lyophilised after pooling and centrifugation. The high level urine was prepared by spiking an aliquot of the pooled and homogenized low-level urine with selected metals, followed by lyophilisation. Due to the centrifugation (which improved sample homogeneity), neither level represents a fresh urine pool from a normal human population.	set (4 x 20 mL)																																													
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Clinical applications

Code Product Unit

Occupational health and hygiene materials in other matrices

NIST-1400 Trace elements in bone ash 50 g

This standard is intended primarily for use in evaluating analytical methods for the determination of selected major, minor and trace elements in bone and in material of a similar matrix. It consists of bone ash that was blended to high degree of homogeneity.

Certified values

Ca	38.18 ± 0.13 %	Mg.....	0.684 ± 0.013 %	Sr	249 ± 7 µg/g
Fe.....	660 ± 27 µg/g	P.....	17.91 ± 0.19 %	Zn.....	181 ± 3 µg/g
K.....	186 ± 8 µg/g	Pb.....	9.07 ± 0.12 µg/g		

NIST-1486 Trace elements in bone meal 50 g

This standard is intended primarily for use in evaluating analytical methods for the determination of selected major, minor and trace elements in bone and in material of similar matrix. It consists of steamed bone meal that was sieved and blended to a high degree of homogeneity.

Certified values

Ca	26.58 ± 0.24 wt%	Fe	99 ± 8 µg/g	Sr	264 ± 7 µg/g
Mg	0.466 ± 0.017 wt%	K.....	412 ± 4 µg/g	Zn.....	147 ± 16 µg/g
P.....	12.30 ± 0.19 wt%	Pb.....	1.335 ± 0.014 µg/g		

BCR-665 Asbestos fibres in human lung 100 mg

The sample consists of at least 100 mg of homogenised and sterilised (gamma irradiated at 25 kGy) human lung tissue.

Type of fibre number of fibres *

Amosite + crocidolite.....	49
Anthophyllite	1.8

* of more than 1 µm in length in million per g dry tissue

BCR-666 Asbestos fibres in lung tissue 100 mg

The sample consists of at least 100 mg of homogenised and sterilised (gamma irradiated at 25 kGy) human lung tissue.

Type of fibre number of fibres *

Amosite + crocidolite.....	2.3
Anthophyllite	5.1

*of more than 1 µm in length in million per g dry tissue

BCR-397 Trace elements in human hair 3 g

The material consists of 3 g of human hair powder in glass bottles provided with a polyethene insert and a screw cap.

Mass fraction of dry mass basis

Cd	0.521 ± 0.024 µg/g	Se	2.00 ± 0.08 µg/g	Cu	(110) µg/g
Hg	12.3 ± 0.5 µg/g	Zn	199 ± 5 µg/g	Ni.....	(46.0) µg/g
Pb.....	33.0 ± 1.2 µg/g	As	(0.31) µg/g	-oe	

NCSZC81002B Trace elements in human hair 7 g

Analytes	µg/g	Analytes	µg/g	Analytes	µg/g
Ag.....	0.037 ± 0.002	Cu.....	33.6 ± 2.3	Ni.....	(5.77)
Al.....	23.2 ± 2.0	Fe	160 ± 16	P.....	174 ± 43
As.....	0.198 ± 0.023	Hg.....	1.06 ± 0.28	S.....	(4.62 in %)
Ba.....	11.1 ± 1.3	I.....	0.96 ± 0.20	Pb.....	3.83 ± 0.18
Br	(0.59)	K.....	(14.4)	Sb.....	0.12 ± 0.02
Ca	1537 ± 68	La.....	(0.029)	Se.....	0.59 ± 0.04
Cl.....	(48.2)	Mg.....	284 ± 14	Sr	8.17 ± 0.69
Cd	0.072 ± 0.010	Mn.....	3.83 ± 0.39	V.....	(0.089)
Co	0.153 ± 0.015	Mo.....	1.06 ± 0.12	Zn.....	191 ± 16
Cr	8.74 ± 0.97	Na.....	445 ± 40		

NCS DC73347-20 Trace elements in human hair powder 20 g

This material is intended primarily for use in trace element analyses of hair. It consists of powdered human hair (<80 Mesh) supplied in a glass bottle containing 20 g.

Certified values, ranging from per cent to ng/g level, are provided for:

Ag, As, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cu, Fe, Hg, La, Li, Mg, Mn, Mo, N, Na, Ni, P, Pb, S, Sb, Sc, Se, Si, Sr, Ti, Y, and Zn).

Indicative values are given for: Au, B, Br, Dy, Eu, K, Sm.

Proteins

BCR-486 Alphafoetoprotein (AFP), human purified amp.

Each sample is in the lyophilised form and it contains purified AFP without additives. The material is kept under nitrogen gas in sealed glass ampoules. The protein mass per ampoule is equivalent to 100 ± 9 µg when the material is reconstituted. Carbohydrate mass of the molecule is not included.

Protein mass per ampoule..... 100 ± 9 µg

BCR-393 Apolipoprotein AI, human amp.

Each sample is in the lyophilised form of a 1.5 mL portion of Apo AI solution without additives. The material is kept under nitrogen gas in sealed glass ampoules. Mass concentration in the reconstituted material 1.06 ± 0.05 g/L

Clinical applications

Code	Product	Unit																																																																								
SERO201505	Trace elements in whole blood, level 1 This reference material is produced from blood collected from thoroughly controlled voluntary blood donors of a Scandinavian blood bank. Each unit is separately controlled and found negative for HBS antigen and HIV I, II and hepatitis C antibodies. No preservatives are added to the samples. It contains all normal constituents which ensures the control and test samples to be analysed under the same conditions. Certified values after reconstitution	10 x 5 mL																																																																								
	<table border="0"> <tr> <td>Al..... 17.1 µg/L</td> <td>Ir..... < 0.5 ng/L</td> <td>Sc..... 15 ng/L</td> </tr> <tr> <td>Sb..... 1.6 µg/L</td> <td>Fe..... 432 mg/L</td> <td>Se..... 79.8 µg/L</td> </tr> <tr> <td>As..... 1.8 µg/L</td> <td>La..... 0.04 µg/L</td> <td>Si..... 0.52 mg/L</td> </tr> <tr> <td>Ba..... 52.6 µg/L</td> <td>Pb..... 27.6 µg/L</td> <td>Ag..... 0.13 µg/L</td> </tr> <tr> <td>Be..... < 0.01 µg/L</td> <td>Li..... 4.9 µg/L</td> <td>Na..... 1313 mg/L</td> </tr> <tr> <td>Bi..... < 0.01 µg/L</td> <td>Lu..... 0.8 ng/L</td> <td>Sr..... 27.8 µg/L</td> </tr> <tr> <td>B..... 26.3 µg/L</td> <td>Mg..... 19.6 mg/L</td> <td>S..... 1223 mg/L</td> </tr> <tr> <td>Br..... 1.1 mg/L</td> <td>Mn..... 10.6 µg/L</td> <td>Ta..... 18 ng/L</td> </tr> <tr> <td>Cd..... 0.74 µg/L</td> <td>Hg..... 2.2 µg/L</td> <td>Te..... 0.03 µg/L</td> </tr> <tr> <td>Ca..... 14.2 mg/L</td> <td>Mo..... 0.5 µg/L</td> <td>Tb..... 1.2 ng/L</td> </tr> <tr> <td>Ce..... 0.05 µg/L</td> <td>Nd..... 0.04 µg/L</td> <td>Tl..... < 0.01 µg/L</td> </tr> <tr> <td>Cs..... 2.3 µg/L</td> <td>Ni..... 1.6 µg/L</td> <td>Th..... < 0.01 µg/L</td> </tr> <tr> <td>Co..... 0.15 µg/L</td> <td>Nb..... 0.05 µg/L</td> <td>Tm..... 1.0 ng/L</td> </tr> <tr> <td>Cr..... 0.6 µg/L</td> <td>Pd..... < 10 ng/L</td> <td>Sn..... 0.34 µg/L</td> </tr> <tr> <td>Cu..... 564 µg/L</td> <td>P..... 239 mg/L</td> <td>Ti..... 2.3 µg/L</td> </tr> <tr> <td>Dy..... 4.8 ng/L</td> <td>Pt..... < 1 ng/L</td> <td>W..... 0.06 µg/L</td> </tr> <tr> <td>Er..... 2.9 ng/L</td> <td>K..... 1101 mg/L</td> <td>U..... 0.17 µg/L</td> </tr> <tr> <td>Eu..... 2.7 ng/L</td> <td>Pr..... < 0.01 µg/L</td> <td>V..... 0.32 µg/L</td> </tr> <tr> <td>Gd..... 50 ng/L</td> <td>Re..... 1.7 ng/L</td> <td>Yb..... 2.3 ng/L</td> </tr> <tr> <td>Ga..... 46 ng/L</td> <td>Rh..... < 0.01 µg/L</td> <td>Y..... 0.05 µg/L</td> </tr> <tr> <td>Ge..... < 0.1 µg/L</td> <td>Rb..... 1278 mg/L</td> <td>Zn..... 5.5 mg/L</td> </tr> <tr> <td>Au..... < 0.01 µg/L</td> <td>Ru..... < 0.02 µg/L</td> <td>Zr..... 0.28 µg/L</td> </tr> <tr> <td>Hf..... 4.0 ng/L</td> <td>Sm..... < 0.01 µg/L</td> <td></td> </tr> <tr> <td>Ho..... 1.1 ng/L</td> <td></td> <td></td> </tr> </table>	Al..... 17.1 µg/L	Ir..... < 0.5 ng/L	Sc..... 15 ng/L	Sb..... 1.6 µg/L	Fe..... 432 mg/L	Se..... 79.8 µg/L	As..... 1.8 µg/L	La..... 0.04 µg/L	Si..... 0.52 mg/L	Ba..... 52.6 µg/L	Pb..... 27.6 µg/L	Ag..... 0.13 µg/L	Be..... < 0.01 µg/L	Li..... 4.9 µg/L	Na..... 1313 mg/L	Bi..... < 0.01 µg/L	Lu..... 0.8 ng/L	Sr..... 27.8 µg/L	B..... 26.3 µg/L	Mg..... 19.6 mg/L	S..... 1223 mg/L	Br..... 1.1 mg/L	Mn..... 10.6 µg/L	Ta..... 18 ng/L	Cd..... 0.74 µg/L	Hg..... 2.2 µg/L	Te..... 0.03 µg/L	Ca..... 14.2 mg/L	Mo..... 0.5 µg/L	Tb..... 1.2 ng/L	Ce..... 0.05 µg/L	Nd..... 0.04 µg/L	Tl..... < 0.01 µg/L	Cs..... 2.3 µg/L	Ni..... 1.6 µg/L	Th..... < 0.01 µg/L	Co..... 0.15 µg/L	Nb..... 0.05 µg/L	Tm..... 1.0 ng/L	Cr..... 0.6 µg/L	Pd..... < 10 ng/L	Sn..... 0.34 µg/L	Cu..... 564 µg/L	P..... 239 mg/L	Ti..... 2.3 µg/L	Dy..... 4.8 ng/L	Pt..... < 1 ng/L	W..... 0.06 µg/L	Er..... 2.9 ng/L	K..... 1101 mg/L	U..... 0.17 µg/L	Eu..... 2.7 ng/L	Pr..... < 0.01 µg/L	V..... 0.32 µg/L	Gd..... 50 ng/L	Re..... 1.7 ng/L	Yb..... 2.3 ng/L	Ga..... 46 ng/L	Rh..... < 0.01 µg/L	Y..... 0.05 µg/L	Ge..... < 0.1 µg/L	Rb..... 1278 mg/L	Zn..... 5.5 mg/L	Au..... < 0.01 µg/L	Ru..... < 0.02 µg/L	Zr..... 0.28 µg/L	Hf..... 4.0 ng/L	Sm..... < 0.01 µg/L		Ho..... 1.1 ng/L			
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	<table border="0"> <tr> <td>Al..... 7.6 µg/L</td> <td>Hf..... 10 ng/L</td> <td>Ru < 100 ng/L</td> </tr> <tr> <td>Ar 0.39 µg/L</td> <td>Hg..... 1.1 µg/L</td> <td>S 1043 mg/L</td> </tr> <tr> <td>As..... 1.3 µg/L</td> <td>Ho..... 7 ng//</td> <td>Sb 51.6 µg/l</td> </tr> <tr> <td>Au 526 µg/L</td> <td>I 61.2 µg/L</td> <td>Sc 27 ng/L</td> </tr> <tr> <td>B 38 µg/L</td> <td>Ir < 10 ng/L</td> <td>Se 59.2 µg/L</td> </tr> <tr> <td>Ba 124 µg/L</td> <td>K 112 mg/L</td> <td>Si 465 µg/L</td> </tr> <tr> <td>Be < 0.02 µg/L</td> <td>La 0.15 µg/L</td> <td>Sm 62 ng/L</td> </tr> <tr> <td>Bi..... 14 ng</td> <td>Li..... 5.20 mg/L</td> <td>Sn 1.24 µg/L</td> </tr> <tr> <td>Br 456 µg/L</td> <td>Mn 8.9 µg/L</td> <td>Sr 25.4 µg/L</td> </tr> <tr> <td>Ca 93.9 mg/L</td> <td>Mg 18.3 mg/L</td> <td>Ta..... 9 ng/L</td> </tr> <tr> <td>Cd 0.50 µg/L</td> <td>Mo 0.52 µg/L</td> <td>Te 505 ng/L</td> </tr> <tr> <td>Ce 0.13 µg/L</td> <td>Na 3040 mg/L</td> <td>Tb..... 9 ng/L</td> </tr> <tr> <td>Cr 0.54 µg/L</td> <td>Nb..... 78 ng/L</td> <td>Th..... 25 ng/L</td> </tr> <tr> <td>Cs 39 ng/L</td> <td>Nd..... 126 ng/L</td> <td>Ti 1.4 µg/L</td> </tr> <tr> <td>Co 0.23 µg/L</td> <td>Ni 4 µg/L</td> <td>Tl 29 ng/L</td> </tr> <tr> <td>Cu 1.17 mg/L</td> <td>Os..... < 20 ng/L</td> <td>Tm..... 4.4 ng/L</td> </tr> <tr> <td>Dy..... 24 ng/L</td> <td>Pa < 100 ng/L</td> <td>U 0.21 µg/L</td> </tr> <tr> <td>Er 29 ng/L</td> <td>P 59 mg/L</td> <td>Va 0.71 µg/L</td> </tr> <tr> <td>Eu 19 ng/L</td> <td>Pb 2.9 µg/L</td> <td>W 0.15 µg/L</td> </tr> <tr> <td>F..... 75 µg/L</td> <td>Pr..... 33 ng/L</td> <td>Y 0.19 µg/L</td> </tr> <tr> <td>Fe..... 1.2 mg/L</td> <td>Pt 12 ng/L</td> <td>Yb..... 21 ng/L</td> </tr> <tr> <td>Ga 19 ng/L</td> <td>Rb..... 3.3 µg/L</td> <td>Zn..... 1.22 mg/L</td> </tr> <tr> <td>Gd 18 ng/L</td> <td>Re..... 4.7 ng/L</td> <td>Zr..... 0.47 µg/L</td> </tr> <tr> <td>Ge < 0.5 µg/L</td> <td>Rh..... <100 ng/L</td> <td></td> </tr> </table>	Al..... 7.6 µg/L	Hf..... 10 ng/L	Ru < 100 ng/L	Ar 0.39 µg/L	Hg..... 1.1 µg/L	S 1043 mg/L	As..... 1.3 µg/L	Ho..... 7 ng//	Sb 51.6 µg/l	Au 526 µg/L	I 61.2 µg/L	Sc 27 ng/L	B 38 µg/L	Ir < 10 ng/L	Se 59.2 µg/L	Ba 124 µg/L	K 112 mg/L	Si 465 µg/L	Be < 0.02 µg/L	La 0.15 µg/L	Sm 62 ng/L	Bi..... 14 ng	Li..... 5.20 mg/L	Sn 1.24 µg/L	Br 456 µg/L	Mn 8.9 µg/L	Sr 25.4 µg/L	Ca 93.9 mg/L	Mg 18.3 mg/L	Ta..... 9 ng/L	Cd 0.50 µg/L	Mo 0.52 µg/L	Te 505 ng/L	Ce 0.13 µg/L	Na 3040 mg/L	Tb..... 9 ng/L	Cr 0.54 µg/L	Nb..... 78 ng/L	Th..... 25 ng/L	Cs 39 ng/L	Nd..... 126 ng/L	Ti 1.4 µg/L	Co 0.23 µg/L	Ni 4 µg/L	Tl 29 ng/L	Cu 1.17 mg/L	Os..... < 20 ng/L	Tm..... 4.4 ng/L	Dy..... 24 ng/L	Pa < 100 ng/L	U 0.21 µg/L	Er 29 ng/L	P 59 mg/L	Va 0.71 µg/L	Eu 19 ng/L	Pb 2.9 µg/L	W 0.15 µg/L	F..... 75 µg/L	Pr..... 33 ng/L	Y 0.19 µg/L	Fe..... 1.2 mg/L	Pt 12 ng/L	Yb..... 21 ng/L	Ga 19 ng/L	Rb..... 3.3 µg/L	Zn..... 1.22 mg/L	Gd 18 ng/L	Re..... 4.7 ng/L	Zr..... 0.47 µg/L	Ge < 0.5 µg/L	Rh..... <100 ng/L		
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Clinical applications

Code	Product	Unit																																																																											
SERO203105	Trace elements in serum, level 2 This reference material is produced from serum collected from thoroughly controlled voluntary blood donors of a Scandinavian blood bank. Each unit is separately controlled and found negative for HBS antigen and HIV I, II and hepatitis C antibodies. No preservatives are added to the samples. Contains all normal constituents which ensure the control and test samples to be analysed under the same conditions. Certified values after reconstitution	6 x 3 mL																																																																											
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SERO201305	Trace elements in urine, level 1 This reference material is produced from human urine from thoroughly controlled voluntary Norwegian donors. Each unit is controlled by official authorities and found negative for presence of HBS antigen and HIV I, II and hepatitis C antibodies. No preservatives are added to the samples. It contains all normal constituents which ensure the control and test samples to be analysed under the same conditions. Certified values after reconstitution	10 x 5 mL																																																																											
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Code	Product	Unit																																																																																	
SERO201205	Trace elements in urine, level 2 This reference material is produced from human urine from thoroughly controlled voluntary Norwegian donors. Each unit is controlled by official authorities and found negative for presence of HBS antigen and HIV 1, II and hepatitis C antibodies. No preservatives are added to the samples. It contains all normal constituents which ensure the control and test samples to be analysed under the same conditions. Certified values after reconstitution	10 x 5 mL																																																																																	
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Blood cell size reference material

BCR-165	Latex spheres, nominal 2 µ Each vial contains 2 mL of an aqueous suspension of latex spheres at a mass concentration of about 0.2 g/L. About 0.5% of the particles are agglomerated doublets. Average particle diameter..... 2.223 ± 0.013 µm	vial
BCR-166	Latex spheres, nominal 4.8 µ Each vial contains 2 mL of an aqueous suspension of latex spheres at a mass concentration of about 0.2 g/L. About 0.5% of the particles are agglomerated doublets. Average particle diameter 4.821 ± 0.019 µm	vial
BCR-167	Latex spheres, nominal 9.6 µ Each vial contains 2 mL of an aqueous suspension of latex spheres at a mass concentration of about 1.4 g/L. About 0.5% of the particles are agglomerated doublets. Average particle diameter..... 9.475 ± 0.018 µm	vial