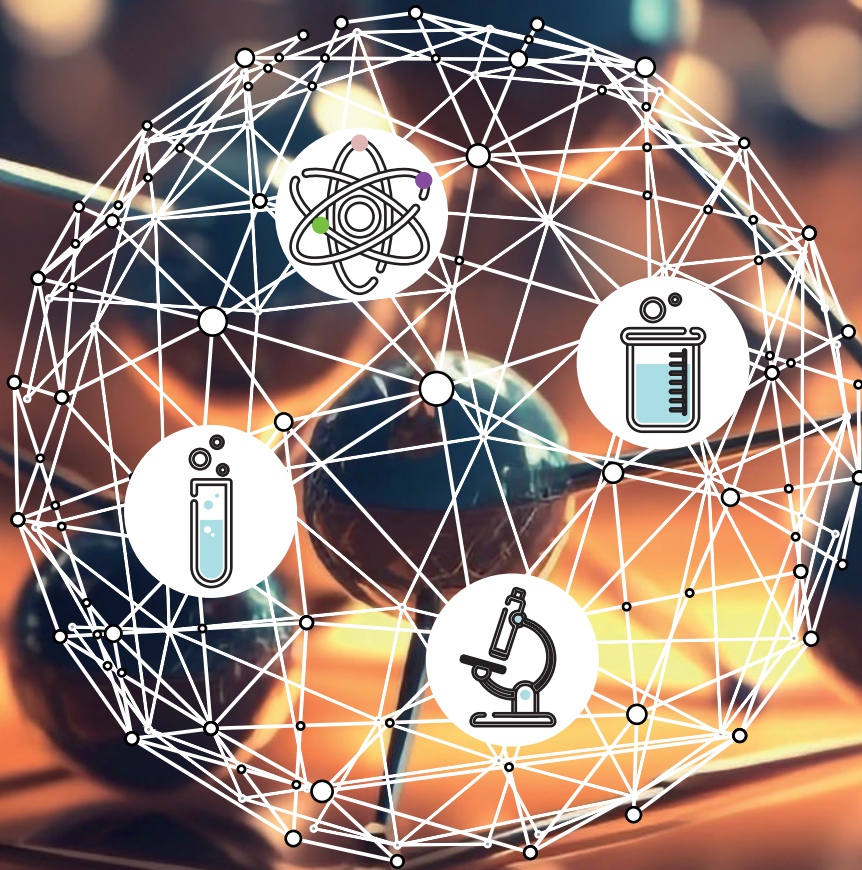


# 인증표준물질

Certified Reference Materials





## 중금속분석을 위한 시료전처리장치와 인증표준물질등 소모품 전문기업!



(주) 오디랩은 2008년 8월에 설립된 회사로 중금속분석에 사용되는 흑연블럭 산 분해장비인 에코프리 I, II, III 시리즈와 산 세척장치, 고순도 산 제조 장치, 유리분주기, ICP/ICP MS 소모품, 인증표준물질(CRM), 숙련도 평가물질 (PT) 등 을 제조, 수입판매하고 있습니다.

(주) 오디랩에서 제조 판매하는 흑연블럭 산 분해장비는 열선 가열판이나 마이크로웨이브의 단점을 보완한 제품으로 국내를 비롯하여 세계 7개국에 특허를 획득하였고 현재 해외로도 수출 중 에 있습니다.

또한 실험실에서 분석 데이터의 신뢰성확보를 위한 인증표준물질(CRM)과 표준물질(RM), 국제숙련도 물질을 전세계에서 수입하여 판매하고 있습니다. 인증표준물질은 고객이 찾으시는 제품을 탐색하여 드리고 있으며, 가장 근접한 제품으로 추천드리고 있습니다.

특히 유럽환경규제인 RoHS에 대응한 IEC62321시험법에 나오는 인증표준 물질을 국내 시험평가기관이나 국가기관에 공급하고 있으며, 환경부에서 실시하는 정도관리에 대응하여 LGC사에서 제공하는 환경관련 숙련도 물질을 공급하고 있습니다.

**저희 (주) 오디랩은 화학실험실의 동반자로서  
분석의 재현성과 정확성, 신뢰성 확보를 위해  
언제나 고객의 노력과 함께 하겠습니다**

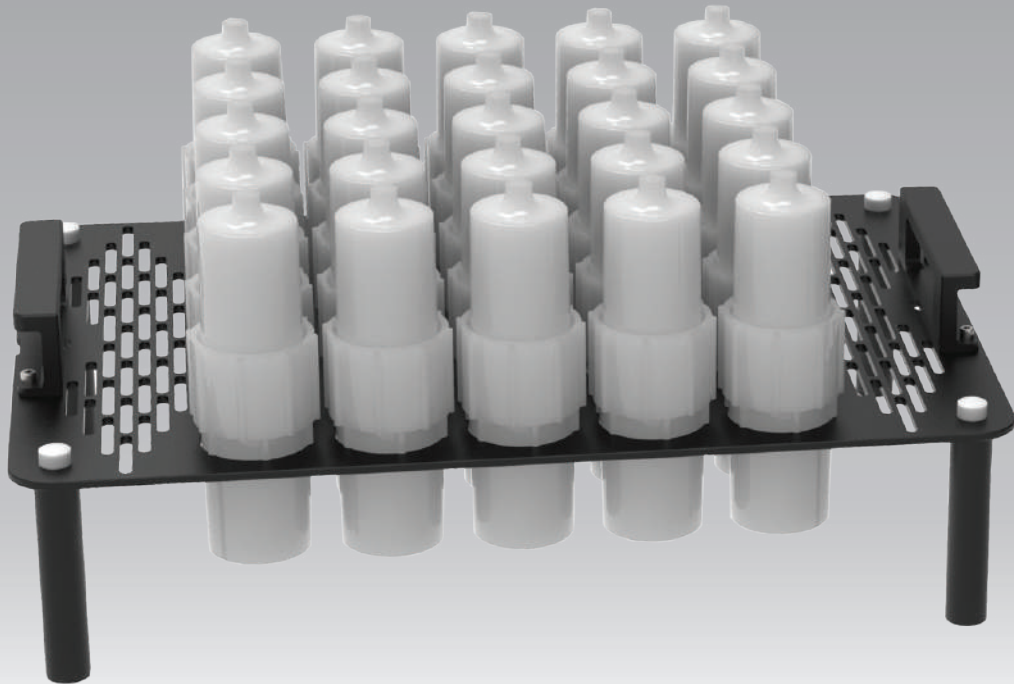
**ODLAB**

자동 산분해장비

**ADS25**



견적문의



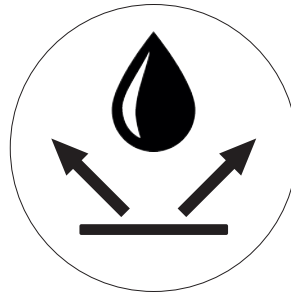
#### 경량화 & 벤틸레이션

경량화 & 벤틸레이션 -



#### 산순환 포집분해용기

산순환 포집분해용기 -



#### 오염방지&내구성

오염방지&내구성 -



#### 앱 연동 조작

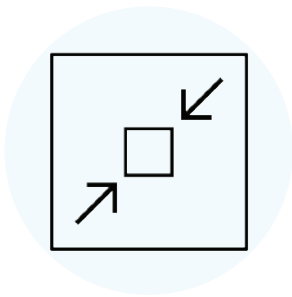
앱 연동 조작 -

이동 및 보관을 위해 플레이트를 타공디자인으로 경량화를 하였습니다 또한 타공을 통하여 원활하게 열기의 순환이 이루어 집니다.

좌우에 있는 리프트 장치로 산 순환 포집분해 용기 내부의 산을 가열 / 냉각 시켜서 사이펀 현상에 의해 리사이클 시켜 시료를 분해할 수 있도록 디자인 하였습니다.

SUS 재질사용 및 테프론 특수코팅을 하여 표면이 쉽게 오염되지 않도록 제작하였습니다. 또한 상부 가열부와 하부 전자제어부는 서로 격리, 밀봉되어 열 또는 산 증기로 인하여 전자제어장치가 손상되지않도록 되어있습니다.

20 Step 으로 가열 / 냉각 으로 분해조건을 프로그래밍 할 수 있으며, 앱을 사용하여 조절가능합니다.



#### 컴팩트한 사이즈

컴팩트한 사이즈 -



#### 오토메틱 리프팅

오토메틱 리프팅 -

메뉴얼 및 프로그래밍 기능으로 반복적인 가열 / 냉각을 할 수 있도록 리프팅 기능이 있습니다.



#### 균일한 온도

균일한 온도 -

흑연 소재를 사용하여 균일한 온도를 제공하고 ( $\pm 1^{\circ}\text{C}$  온도편차를 갖는다) 제어는  $0.2^{\circ}\text{C}$  로 제어된다.



#### 수동 승강버튼

수동 승강버튼 -

리프트 장치를 수동버튼을 사용하여 상부 랙(Rack)을 상하로 움직여 사용자가 원할 시 용기의 상태를 언제든지 확인 할 수 있습니다.



**GLASS EXPANSION**  
Quality By Design

# ICP-OES / ICP-MS

모든 메이커 (애질런트, 씨모, 퍼킨..etc) 전제품



견적문의

# Miscellaneous

본 자료는 시기에 따라 제품 단종 및 수치의 변경이 있을 수 있으니 본사로 문의 부탁드립니다.

## Miscellaneous

Code	Product	Unit		
<b>BAM-M504b</b>	<b>Used Automobile Catalyst</b>	200 g		
	The material is a mixture of used automobile catalysts supplied and prepared by a commercial manufacturer.			
	Certified Values			
	Element	Mass fraction (mg/kg)		
	Pt .....	1159		
	Pd .....	1128		
	Rh .....	314.2		
<b>BAM-M505a</b>	<b>Electronic scrap</b>	200 g		
	The material consists of used electronic circuit boards that have been ashed and melted with pyrite (FeS <sub>2</sub> ).			
	Certified Values			
	Element	Mass fraction (%)	Element	Mass fraction (mg/kg)
	Cu .....	16.76	Au .....	52.4
	Ni .....	0.694	Pd .....	48.0
	Ag .....	0.0633	Pt .....	5.7
	Pb .....	1.13	As .....	372
	Cr .....	0.980	Be .....	6.8
	Sn .....	0.468	Cd .....	16.4
<b>BAM-N008</b>	<b>Silver nanoparticles</b>	5 ml		
	The material is filled in amber narrow-mouth plastic bottles containing 5 ml of aqueous suspension of silver nanoparticles.			
	Certified Values			
	Property	Value nm		
	Diameter .....	5.8		
<b>BAM-P109</b>	<b>Activated nanoporous carbon</b>	10 g		
	A unit of BAM-P109 consists of a single bottle containing approximately 10 g of an activated nanoporous carbon material (micro beads, diameters about 250 ... 500 µm).			
	Certified Values			
	ABET in m <sup>2</sup> /g .....	1396		
<b>BAM-P110</b>	<b>Titanium dioxide (anatase)</b>	10 g		
	A unit of BAM-P109 consists of a single bottle containing approximately 10 g of an activated nanoporous carbon material (micro beads, diameters about 250 ... 500 µm).			
	Certified Values			
	ABET in m <sup>2</sup> /g .....	107.8		



## Miscellaneous

Code	Product	Unit														
<b>BAM-P114</b>	<b>Titanium dioxide (anatase/rutile)</b>	25 g														
	<p>A unit of the BAM-P114 consists of a single glass bottle containing approximately 18 g of crystalline titanium dioxide (TiO<sub>2</sub>) powder consisting of a mix of the modifications anatase (56 %) and rutile (44 %) with a particle size distribution ranging from 10 to 100 µm and a pore sizes of 30 nm.</p>															
	<p>Certified value</p> <table> <thead> <tr> <th>Property</th> <th>Value m<sup>2</sup>/g</th> </tr> </thead> <tbody> <tr> <td>Specific surface area ABET .....</td> <td>24.48</td> </tr> </tbody> </table>		Property	Value m <sup>2</sup> /g	Specific surface area ABET .....	24.48										
Property	Value m <sup>2</sup> /g															
Specific surface area ABET .....	24.48															
<b>BAM-P115</b>	<b>Nanoporous titanium dioxide</b>	12 g														
	<p>A unit of the CRM BAM-P115 consists of a single glass bottle containing approximately 12 g of crystalline titanium dioxide powder in the modification anatase with a mean particle size of about 30 µm.</p>															
	<p>Certified value</p> <table> <thead> <tr> <th>Property</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Specific Surface Area ABET .....</td> <td>147.3 m<sup>2</sup>/g</td> </tr> <tr> <td>Specific pore volume V<sub>p,0.99</sub> .....</td> <td>0.214 cm<sup>3</sup>/g</td> </tr> <tr> <td>Hydraulic pore diameter 4V<sub>p,0.99</sub>/ABET .....</td> <td>5.79 nm</td> </tr> <tr> <td>Modal pore diameter DBJH,des .....</td> <td>4.75 nm</td> </tr> <tr> <td>Modal pore diameter DBJH,ads .....</td> <td>5.40 nm</td> </tr> </tbody> </table>		Property	Value	Specific Surface Area ABET .....	147.3 m <sup>2</sup> /g	Specific pore volume V <sub>p,0.99</sub> .....	0.214 cm <sup>3</sup> /g	Hydraulic pore diameter 4V <sub>p,0.99</sub> /ABET .....	5.79 nm	Modal pore diameter DBJH,des .....	4.75 nm	Modal pore diameter DBJH,ads .....	5.40 nm		
Property	Value															
Specific Surface Area ABET .....	147.3 m <sup>2</sup> /g															
Specific pore volume V <sub>p,0.99</sub> .....	0.214 cm <sup>3</sup> /g															
Hydraulic pore diameter 4V <sub>p,0.99</sub> /ABET .....	5.79 nm															
Modal pore diameter DBJH,des .....	4.75 nm															
Modal pore diameter DBJH,ads .....	5.40 nm															
<b>BAM-P116</b>	<b>Titanium dioxide (anatase)</b>	8 g														
	<p>A unit of the CRM BAM-P116 consists of a single glass bottle containing approximately 8 g of crystalline, pure titanium dioxide powder in the modification anatase (99.5%) with a mean particle size of about 25 µm.</p>															
	<p>Certified value</p> <table> <thead> <tr> <th>Property</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Specific Surface Area ABET .....</td> <td>325 m<sup>2</sup>/g</td> </tr> </tbody> </table>		Property	Value	Specific Surface Area ABET .....	325 m <sup>2</sup> /g										
Property	Value															
Specific Surface Area ABET .....	325 m <sup>2</sup> /g															
<b>BAM-P127</b>	<b>Pellets of alumina</b>	10 g														
	<p>The material consists of alumina beads.                      The primary particles of the material form stable agglomerates.                      With mercury porosimetry, the pores within the agglomerates are measured.</p>															
	<p>Certified value</p> <table> <thead> <tr> <th>Property</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Specific Pore Volume at 50 MPa .....</td> <td>69.4 mm<sup>3</sup> g<sup>-1</sup></td> </tr> <tr> <td>Specific Pore Volume at 100 MPa .....</td> <td>625.4 mm<sup>3</sup> g<sup>-1</sup></td> </tr> <tr> <td>Specific Pore Volume at 195 MPa .....</td> <td>637.1 mm<sup>3</sup> g<sup>-1</sup></td> </tr> <tr> <td>Specific Pore Volume at 395 MPa .....</td> <td>638.6 mm<sup>3</sup> g<sup>-1</sup></td> </tr> <tr> <td>Mean Pore Diameter d<sub>50</sub> .....</td> <td>24.2 nm</td> </tr> <tr> <td>Most Frequent Pore Diameter d<sub>p,m</sub> .....</td> <td>23.9 nm</td> </tr> </tbody> </table>		Property	Value	Specific Pore Volume at 50 MPa .....	69.4 mm <sup>3</sup> g <sup>-1</sup>	Specific Pore Volume at 100 MPa .....	625.4 mm <sup>3</sup> g <sup>-1</sup>	Specific Pore Volume at 195 MPa .....	637.1 mm <sup>3</sup> g <sup>-1</sup>	Specific Pore Volume at 395 MPa .....	638.6 mm <sup>3</sup> g <sup>-1</sup>	Mean Pore Diameter d <sub>50</sub> .....	24.2 nm	Most Frequent Pore Diameter d <sub>p,m</sub> .....	23.9 nm
Property	Value															
Specific Pore Volume at 50 MPa .....	69.4 mm <sup>3</sup> g <sup>-1</sup>															
Specific Pore Volume at 100 MPa .....	625.4 mm <sup>3</sup> g <sup>-1</sup>															
Specific Pore Volume at 195 MPa .....	637.1 mm <sup>3</sup> g <sup>-1</sup>															
Specific Pore Volume at 395 MPa .....	638.6 mm <sup>3</sup> g <sup>-1</sup>															
Mean Pore Diameter d <sub>50</sub> .....	24.2 nm															
Most Frequent Pore Diameter d <sub>p,m</sub> .....	23.9 nm															

## Miscellaneous

Code	Product	Unit
<b>BAM-P128</b>	Macroporous alumina ceramic (cylinder)	7 g
	A unit of BAM-P128 consists of six cylinders of macroporous extruded and burnt alumina ceramic (Al <sub>2</sub> O <sub>3</sub> ) material.	
	Certified Values	
	Property	Value
	Density ps .....	3.6405 g/cm <sup>3</sup>
<b>BCR-546</b>	FORMALDEHYDE-2,4-DINITROPHENYLHYDRAZONE (purity)	5 mg
	The material consists of approximately 5 mg of solid material in glass vials closed with screw caps. The vial is stored in a vacuum-sealed aluminium pouch.	
	Certified Values	
	Property	(%)
	2,4-dinitrophenylhydrazone of formaldehyde .....	> 99.3
<b>BCR-547</b>	2,4-DINITROPHENYLHYDRAZONE DERIVATIVE OF ACETALDEHYDE	5 mg
	The material consists of approximately 5 mg of solid material in glass vials closed with screw caps. The vial is stored in a vacuum-sealed aluminium pouch.	
	Certified Values	
	Property	(%)
	2,4-dinitrophenylhydrazone of acetaldehyde .....	98.3
<b>BCR-548</b>	ACROLEIN-2,4-DINITROPHENYLHYDRAZONE (purity)	5 mg
	The material consists of approximately 5 mg of solid material in glass vials closed with screw caps. The vial is stored in a vacuum-sealed aluminium pouch.	
	Certified Values	
	Property	(%)
	2,4-dinitrophenylhydrazone of acetaldehyde .....	98.3
<b>BAM-549</b>	Titanium dioxide (anatase)	5 mg
	The material consists of approximately 5 mg of solid material in glass vials closed with screw caps. The vial is stored in a vacuum-sealed aluminium pouch	
	Certified Values	
	Property	(%)
	2,4-dinitrophenylhydrazone of acetone .....	> 99.6
<b>BAM-550</b>	GLUTARALDEHYDE-2,4-DINITROPHENYLHYDRAZONE (purity)	5 mg
	The material consists of approximately 5 mg of solid material in glass vials closed with screw caps. The vial is stored in a vacuum-sealed aluminium pouch.	

## Miscellaneous

Code	Product	Unit
	<p>Certified value</p> <p>Property (%)</p> <p>2,4-dinitrophenylhydrazone of glutaraldehyde ..... &gt; 98.1</p>	
<b>BCR-553</b>	<p><b>FORMALDEHYDE-2,4-DINITROPHENYLHYDRAZONE on filter</b></p> <p>The material consists of air-dried glass fibre filter impregnated with formaldehyde-2,4-dinitrophenylhydrazone in a glass vial. The glass vial is closed with a screw cap and sealed under vacuum in an aluminium pouch.</p> <p>Certified value</p> <p>Compound (µg/filter)</p> <p>2,4-dinitrophenylhydrazone of formaldehyde ..... 4.96</p>	10 g
<b>BCR-165</b>	<p><b>LATEX SPHERES (particle diameter 2.2 microns)</b></p> <p>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.</p> <p>Certified value</p> <p>Property (µm)</p> <p>Average particle diameter ..... 2.223</p>	2 g
<b>BCR-166</b>	<p><b>LATEX SPHERES (particle diameter 4.8 microns)</b></p> <p>Each vial contains 2 mL of an aqueous suspension of latex spheres, at a mass concentration of about 2 g/L. About 0.5 % of the particles are agglomerated doublets.</p> <p>Certified value</p> <p>Property (µm)</p> <p>Average particle diameter ..... 4.821</p>	10 g
<b>BCR-167</b>	<p><b>LATEX SPHERES (particle diameter 9.6 microns)</b></p> <p>Each vial contains 2 mL of an aqueous suspension of latex spheres, at a mass concentration of about 2 g/L. About 0.5 % of the particles are agglomerated doublets.</p> <p>Certified value</p> <p>Property (µm)</p> <p>Average particle diameter ..... 9.475</p>	10 g
<b>ERM-AD149</b>	<p><b>THROMBOPLASTIN RABBIT (prothrombin time)</b></p> <p>The sample is the lyophilized form of an 0.5 mL aliquot of the extract of rabbit brain tissue, without calcium ion added. It is kept under nitrogen (87 kPa) in sealed glass ampoules. The water mass fraction is 0.012 and the haemoglobin concentration below the detection limit.</p>	2 g

## Certified Values

Property	Value
Parameters of the regression line of the reconstituted sample	Slope d = 1.257 Intercept c = - 0.242

Code	Product	Unit
<b>BCR-113</b>	<b>POTASSIUM CHLORIDE FERTILIZER (elemental composition)</b>	<b>100 g</b>

The sample consists of a homogeneous powder (particle size less than 500 µm). The CRM is available in units of 100 g. As the sample is representative for this type of potassium fertilisers, it contains a special anticaking product (a commercial mixture of aliphatic primary amines with chain lengths C16-C18) with a mass fraction of 0.02-0.03 %.

## Certified Values

Property	Value (mg/g)	Property	Value (mg/g)
K	502.5	Na	15.3
K (water soluble)	501.3	Ca	1.03
Cl	478.0	Mg	0.24

Code	Product	Unit
<b>BCR-114</b>	<b>POTASSIUM SULPHATE FERTILIZER (elemental composition)</b>	<b>100 g</b>

The sample consists of a homogeneous powder (particle size less than 150 µm). The CRM is available in units of 100 g.

## Certified Values

Property	Value (mg/g)	Property	Value (mg/g)
K	418	Cl	18.5
K (water soluble)	417.6	Na	11.0
SO <sub>4</sub> <sup>2-</sup>	533	Ca	9.4
		Mg	0.74

Code	Product	Unit
<b>BCR-115</b>	<b>ANIMAL FEED (OCP's)</b>	<b>30 g</b>

The sample consists of a homogenised animal feed obtained from commonly used ingredients (selected to mimic a mixture of pig and poultry diet) and enriched with organochlorine pesticides.

It is provided in sealed hard glass ampoules containing approx. 25 g under dry N<sub>2</sub>. Additional information on the presence of α-HCH, p,p'-DDT, p,p'-DDE, β-heptachlorepoxyde and aldrin is given in the report.

## Certified Values

Compound	mg/kg	Compound	mg/kg
HCB 0.0194		γ-Chlordane 0.048	
β-HCH 0.0234		α-Endosulfan 0.046	
γ-HCH 0.0218		Dieldrin 0.0181	
Heptachlor 0.0190		Endrin 0.046	
		p,p'-DDE 0.047	

## Miscellaneous

Code	Product	Unit																								
<b>BCR-178</b>	<b>FORMALDEHYDE-2,4-DINITROPHENYLHYDRAZONE on filter</b>	100 g																								
	<p>The sample consists of a homogeneous powder (particle size: 1.48–1.67 mm) taken from a batch of commercially produced calcium ammonium nitrate. The CRM is available in brown bottles containing approximately 100 g.</p>																									
	<p>Certified value</p> <table border="1"> <thead> <tr> <th>Compound</th> <th>Certified value [mg/g]</th> <th>Compound</th> <th>Certified value [mg/g]</th> </tr> </thead> <tbody> <tr> <td>Ammoniacal-N .....</td> <td>130.44</td> <td>Total N .....</td> <td>260.19</td> </tr> <tr> <td>Nitrate-N .....</td> <td>130.15</td> <td>Ca .....</td> <td>88.82</td> </tr> </tbody> </table>		Compound	Certified value [mg/g]	Compound	Certified value [mg/g]	Ammoniacal-N .....	130.44	Total N .....	260.19	Nitrate-N .....	130.15	Ca .....	88.82												
Compound	Certified value [mg/g]	Compound	Certified value [mg/g]																							
Ammoniacal-N .....	130.44	Total N .....	260.19																							
Nitrate-N .....	130.15	Ca .....	88.82																							
<b>NIST-2186I</b> <b>NIST-2186II</b>	<b>Potassium Dihydrogen Phosphate</b>	30 g																								
	<p>These lots of potassium dihydrogen phosphate (KH<sub>2</sub>PO<sub>4</sub>) and disodium hydrogen phosphate (Na<sub>2</sub>HPO<sub>4</sub>) were prepared to ensure high purity and uniformity.</p>																									
	<p>Certified value</p> <table border="1"> <thead> <tr> <th>t, °C</th> <th>pD (S)</th> <th>t, °C</th> <th>pD (S)</th> </tr> </thead> <tbody> <tr> <td>5 .....</td> <td>7.539</td> <td>30 .....</td> <td>7.411</td> </tr> <tr> <td>10 .....</td> <td>7.504</td> <td>35 .....</td> <td>7.397</td> </tr> <tr> <td>15 .....</td> <td>7.475</td> <td>40 .....</td> <td>7.387</td> </tr> <tr> <td>20 .....</td> <td>7.449</td> <td>45 .....</td> <td>7.381</td> </tr> <tr> <td>25 .....</td> <td>7.428</td> <td>50 .....</td> <td>7.377</td> </tr> </tbody> </table>		t, °C	pD (S)	t, °C	pD (S)	5 .....	7.539	30 .....	7.411	10 .....	7.504	35 .....	7.397	15 .....	7.475	40 .....	7.387	20 .....	7.449	45 .....	7.381	25 .....	7.428	50 .....	7.377
t, °C	pD (S)	t, °C	pD (S)																							
5 .....	7.539	30 .....	7.411																							
10 .....	7.504	35 .....	7.397																							
15 .....	7.475	40 .....	7.387																							
20 .....	7.449	45 .....	7.381																							
25 .....	7.428	50 .....	7.377																							
<b>NIST-2191a</b> <b>NIST-2192a</b>	<b>Sodium Bicarbonate</b>	30 g																								
	<p>These are intended for use in preparing buffer solutions to calibrate electrodes for pD measuring systems.</p>																									
	<p>Certified value</p> <table border="1"> <thead> <tr> <th>t, °C</th> <th>pD (S)</th> <th>t, °C</th> <th>pD (S)</th> </tr> </thead> <tbody> <tr> <td>5 .....</td> <td>10.993</td> <td>30 .....</td> <td>10.684</td> </tr> <tr> <td>10 .....</td> <td>10.917</td> <td>35 .....</td> <td>10.641</td> </tr> <tr> <td>15 .....</td> <td>10.849</td> <td>40 .....</td> <td>10.60</td> </tr> <tr> <td>20 .....</td> <td>10.787</td> <td>45 .....</td> <td>10.57</td> </tr> <tr> <td>25 .....</td> <td>10.732</td> <td>50 .....</td> <td>10.54</td> </tr> </tbody> </table>		t, °C	pD (S)	t, °C	pD (S)	5 .....	10.993	30 .....	10.684	10 .....	10.917	35 .....	10.641	15 .....	10.849	40 .....	10.60	20 .....	10.787	45 .....	10.57	25 .....	10.732	50 .....	10.54
t, °C	pD (S)	t, °C	pD (S)																							
5 .....	10.993	30 .....	10.684																							
10 .....	10.917	35 .....	10.641																							
15 .....	10.849	40 .....	10.60																							
20 .....	10.787	45 .....	10.57																							
25 .....	10.732	50 .....	10.54																							
<b>NIST-3109a</b>	<b>THROMBOPLASTIN RABBIT (prothrombin time)</b>	5 x 10 mL																								
	<p>It is intended for use as a primary calibration standard for the quantitative determination of calcium.</p>																									
	<p>Certified Calcium Mass Fraction ..... 9.819 mg/g ± 0.019 mg/g</p>																									
<b>NIST-975a</b>	<b>Isotopic Standard for Chlorine</b>	0.25 g																								
	<p>It is intended for use as an isotopic standard. SRM 975a consists of 0.25 g of sodium chloride (NaCl). Purity of the NaCl is 99.89 % by mass.</p>																									

## Miscellaneous

Code	Product	Unit
	Absolute Abundance Ratio, $^{35}\text{Cl}/^{37}\text{Cl}$ ..... 3.1279 ± 0.0047	
	Isotopic Composition:	
	$^{35}\text{Cl}$ , Atom Percent ..... 75.774 ± 0.028	
	$^{37}\text{Cl}$ , Atom Percent ..... 24.226 ± 0.028	
	Atomic Weight ..... 35.45265 ± 0.00055	
<b>NIST-977</b>	<b>Isotopic Standard for Bromine</b>	0.25 g
	Absolute Abundance Ratio, Br-79/Br-81 ..... 1.02784 ± 0.00105	
	Bromine-79, atom percent ..... 50.686 ± 0.025	
	Bromine-81, atom percent ..... 49.314 ± 0.025	
<b>NIST-979</b>	<b>Isotopic Standard for Chromium</b>	0.25 g
	Absolute Abundance Ratio, Cr-50/Cr-52 ..... 0.05186 ± 0.0010	
	Absolute Abundance Ratio, Cr-53/Cr-52 ..... 0.11339 ± 0.00015	
	Absolute Abundance Ratio, Cr-54/Cr-52 ..... 0.02822 ± 0.00006	
	<b>Chromium-50</b> , atom percent ..... 4.345 ± 0.009	
	<b>Chromium-52</b> , atom percent ..... 83.789 ± 0.012	
	<b>Chromium-53</b> , atom percent ..... 9.501 ± 0.011	
	<b>Chromium-54</b> , atom percent ..... 2.365 ± 0.005	
<b>NIST-980</b>	<b>Isotopic Standard for Magnesium</b>	0.25 g
	Absolute Abundance Ratio, Mg-25/Mg-24 ..... 0.12663 ± 0.00013	
	Absolute Abundance Ratio, Mg-26/Mg-24 ..... 0.13932 ± 0.00026	
	<b>Magnesium-24</b> , atom percent ..... 78.992 ± 0.025	
	<b>Magnesium-25</b> , atom percent ..... 10.003 ± 0.009	
	<b>Magnesium-26</b> , atom percent ..... 11.005 ± 0.019	
<b>NIST-2141</b>	<b>Urea (Nitrogen in Organic Matter)</b>	2 g
	It is certified for use in the calibration and standardization of microchemical procedures for the determination of nitrogen in organic matter.	
	Nitrogen (Percent) ..... 46.63 ± 0.02	
<b>NIST-2556</b>	<b>Used Auto Catalyst (Pellets)</b>	70 g
	It is intended for use in evaluating chemical and instrumental methods for the analysis of platinum group metal and lead.	
	Certified value	
	Elements	Mass Fraction (mg/kg)
	Pt ..... 697.4 ± 2.3	Rh ..... 51.2 ± 0.5
	Pd ..... 326 ± 1.6	Pb ..... 6228 ± 49

## Miscellaneous

Code	Product	Unit
<b>NIST-2557</b>	<b>Used Auto Catalyst (Monolith)</b>	70 g
	It is intended for use in evaluating chemical and instrumental methods for the analysis of platinum group metal and lead.	
	Certified value	
	Elements	Mass Fraction (mg/kg)
	Pt .....	1131 ± 11
	Rh .....	135.1 ± 1.9
	Pd .....	233.2 ± 1.9
	Pb .....	13931 ± 97
<b>NIST-1677c</b>	<b>Carbon Monoxide in Nitrogen (Nominal Amount-of-Substance Fraction 10 µmol/mol)</b>	6 L cylinder
	It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.	
	Carbon Monoxide Concentration : 9.893 µmol/mol ± 0.023 µmol/mol	
	Cylinder Number: SAMPLE	NIST Sample Number: SAMPLE
	Hydrotest Date: SAMPLE	Blend Date: September 2009
<b>NIST-1678c</b>	<b>Carbon Monoxide in Nitrogen (Nominal Amount-of-Substance Fraction 10 µmol/mol)</b>	6 L cylinder
	It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.	
	Carbon Monoxide Concentration : 49.136 µmol/mol ± 0.065 µmol/mol	
	Cylinder Number: SAMPLE	NIST Sample Number: SAMPLE
	Hydrotest Date: September 2012	Blend Date: October 2012
<b>NIST-1679c</b>	<b>Carbon Monoxide in Nitrogen (Nominal Amount-of-Substance Fraction 100 µmol/mol)</b>	6 L cylinder
	It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.	
	Carbon Monoxide Concentration : 99.28 µmol/mol ± 0.21 µmol/mol	
	Cylinder Number : sample	NIST Sample Number: sample
	Hydrotest Date : sample	Blend Date: June, 2014
<b>ERM-1680b</b>	<b>Carbon Monoxide in Nitrogen (Nominal Amount-of-Substance Fraction 500 µmol/mol)</b>	6 L cylinder
	It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.	
	Carbon Monoxide Concentration : 494.8 µmol/mol ± 1.0 µmol/mol	
	Cylinder Number : SAMPLE	NIST Sample Number: SAMPLE
	Hydrotest Date : SAMPLE	Blend Date: August 2013

## Miscellaneous

Code	Product	Unit
<b>NIST-1681b</b>	<b>Carbon Monoxide in Nitrogen</b> <b>(Nominal Amount-of-Substance Fraction 1000 µmol/mol)</b>	6 L cylinder
It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.		
Carbon Monoxide Concentration : 988.7 µmol/mol ± 2.0 µmol/mol Cylinder Number: SAMPLE                      NIST Sample Number: SAMPLE Hydrotest Date: January 2016                      Blend Date: October 2018		
<b>NIST-2613a</b>	<b>Carbon Monoxide in Air</b> <b>(Nominal Amount-of-Substance Fraction 20 µmol/mol)</b>	6 L cylinder
It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.		
Carbon Monoxide Concentration : 19.72 µmol/mol ± 0.25 µmol/mol Cylinder Number : Sample                      NIST Sample Number: Sample Hydrotest Date : March 1994                      Blend Date: March 1995		
<b>NIST-2635a</b>	<b>Carbon Monoxide in Nitrogen</b> <b>(Nominal Amount-of-Substance Fraction 25 µmol/mol)</b>	6 L cylinder
It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.		
Carbon Monoxide Concentration : 24.512 µmol/mol ± 0.029 µmol/mol Cylinder Number : SAMPLE                      NIST Sample Number: SAMPLE Hydrotest Date : November 2010                      Blend Date: February 2011		
<b>NIST-2636a</b>	<b>Carbon Monoxide in Nitrogen</b> <b>(Nominal Amount-of-Substance Fraction 250 µmol/mol)</b>	6 L cylinder
It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.		
Carbon Monoxide Concentration : 248.87 µmol/mol ± 0.54 µmol/mol Cylinder Number : Sample                      NIST Sample Number: Sample Hydrotest Date : November 2015                      Blend Date: January 2016		
<b>NIST-2637a</b>	<b>Carbon Monoxide in Nitrogen</b> <b>(Nominal Amount-of-Substance Fraction 2500 µmol/mol)</b>	6 L cylinder
This SRM is a primary gas mixture supplied in a DOT 3AL-specification aluminum (6061 alloy) cylinder with a water volume of 6 L.		
Carbon Monoxide Concentration : 2472.8 µmol/mol ± 4.2 µmol Cylinder Number : SAMPLE                      NIST Sample Number: SAMPLE Hydrotest Date : SAMPLE                      Blend date: November 2013		



## Miscellaneous

Code	Product	Unit				
<b>NIST-2638a</b>	<b>Carbon Monoxide in Nitrogen</b> <b>(Nominal Amount-of-Substance Fraction 5000 µmol/mol)</b>  It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.  Carbon Monoxide Concentration : 4957.9 µmol/mol ± 7.4 µmol/mol Cylinder Number : SAMPLE                      NIST Sample Number: SAMPLE Hydrotest Date : January 2016                      Blend Date: October 2018	6 L cylinder				
<b>NIST-2741a</b>	<b>Carbon Monoxide in Nitrogen</b> <b>(Nominal Amount-of-Substance Fraction 13 % mol/mol)</b>  It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.  Carbon Monoxide Concentration: 12.969 % mol/mol ± 0.027 % mol/mol Cylinder Number : SAMPLE                      NIST Sample Number: SAMPLE Hydrotest Date : July 2009                      Blend Date: September 2009	6 L cylinder				
<b>NIST-1668b</b>	<b>Propane in Air</b> <b>(Nominal Amount-of-Substance Fraction 100 µmol/mol)</b>  It is a primary gas mixture for which the amount-of-substance fraction, expressed as concentration, may be related to secondary working standards.  Propane Concentration : 98.68 µmol/mol ± 0.14 µmol/mol Cylinder Number : SAMPLE                      NIST Sample Number: SAMPLE Hydrotest Date : SAMPLE                      Blend Date: November 2010	6 L cylinder				
<b>NIST-869b</b>	<b>Column Selectivity Test Mixture for Liquid Chromatography</b> <b>(Polycyclic Aromatic Hydrocarbons)</b>  It is a mixture of three polycyclic aromatic hydrocarbons (PAHs) in acetonitrile: benzo[a]pyrene (BaP), 1,2:3,4:5,6:7,8-tetrabenzonaphthalene (TBN, alternate name, dibenzo[g,p]chrysene), and phenanthro[3,4-c]phenanthrene (PhPh) (see Figure 1 for structures).  Certified value <table> <thead> <tr> <th>Compound</th> <th>Mass Fraction (mg/kg)</th> </tr> </thead> <tbody> <tr> <td>Benzo[a]pyrene (BaP) .....</td> <td>2.06 ± 0.05</td> </tr> </tbody> </table>	Compound	Mass Fraction (mg/kg)	Benzo[a]pyrene (BaP) .....	2.06 ± 0.05	5 x 1.1 mL
Compound	Mass Fraction (mg/kg)					
Benzo[a]pyrene (BaP) .....	2.06 ± 0.05					
<b>NIST-870</b>	<b>Column Performance Test Mixture for Liquid Chromatography</b>  It is a mixture of five organic compounds in methanol and is intended for use in characterizing general aspects of liquid chromatographic (LC) column performance, including efficiency, void volume, methylene selectivity, retentiveness, and activity toward chelators and organic bases.  Certified value <table> <thead> <tr> <th>Compound</th> <th>Mass Fraction (mg/kg)</th> </tr> </thead> <tbody> <tr> <td>Uracil .....</td> <td>27.1 ± 1.3</td> </tr> </tbody> </table>	Compound	Mass Fraction (mg/kg)	Uracil .....	27.1 ± 1.3	5 x 1.1 mL
Compound	Mass Fraction (mg/kg)					
Uracil .....	27.1 ± 1.3					

## Miscellaneous

Code	Product	Unit
	Toluene .....	1430 ± 40
	Ethyl Benzene .....	1730 ± 40
	Quinizarin .....	90.8 ± 2.5
	Amitriptyline HCl .....	2740 ± 150

### NIST-1491a Methyl-Substituted Polycyclic Aromatic Hydrocarbons in Toluene 5 x 1.2 mL

It is a solution of 18 methyl-substituted polycyclic aromatic hydrocarbons (PAHs), from methylnaphthalenes to methylchrysenes, in toluene.

Certified value

Compound	Mass Fraction (mg/kg)
1-Methylnaphthalene .....	1.758 ± 0.041
2-Methylnaphthalene .....	2.030 ± 0.096
1,2-Dimethylnaphthalene .....	1.990 ± 0.071
1,6-Dimethylnaphthalene .....	1.607 ± 0.036
2,6-Dimethylnaphthalene .....	1.564 ± 0.053
1-Methylphenanthrene .....	2.243 ± 0.028
2-Methylphenanthrene .....	2.396 ± 0.018
3-Methylphenanthrene .....	2.134 ± 0.010
9-Methylphenanthrene .....	2.288 ± 0.019
2-Methylanthracene .....	1.355 ± 0.010
1,7-Dimethylphenanthrene .....	1.962 ± 0.027
1-Methylfluoranthene .....	1.116 ± 0.011
3-Methylfluoranthene .....	1.190 ± 0.014
1-Methylpyrene .....	1.089 ± 0.013
4-Methylpyrene .....	1.026 ± 0.012
Retene .....	2.079 ± 0.032
3-Methylchrysene .....	1.132 ± 0.026
6-Methylchrysene .....	1.200 ± 0.014

### NIST-2274 Polychlorinated Biphenyl Congeners in 2,2,4-Trimethylpentane 5 x 1.2 mL

It is a solution of 11 polychlorinated biphenyl (PCB) congeners in 2,2,4-trimethylpentane (isooctane) intended primarily for use in the calibration of chromatographic instrumentation.

Certified value

Compound	Mass Fraction (mg/kg)
2,4',5'-Trichlorobiphenyl .....	2.929 ± 0.074
2,2',4,5'-Tetrachlorobiphenyl .....	2.916 ± 0.072
2,2',3,4',6'-Pentachlorobiphenyl .....	2.925 ± 0.063
2,2',4,4',5'-Pentachlorobiphenyl .....	2.933 ± 0.062
2,3,3',4',6'-Pentachlorobiphenyl .....	2.911 ± 0.059
2,2',3,4',5',6'-Hexachlorobiphenyl .....	2.911 ± 0.068
2,2',3,5,5',6'-Hexachlorobiphenyl .....	2.904 ± 0.064
2,3,3',4,4',5'-Hexachlorobiphenyl .....	2.917 ± 0.059
3,3',4,4',5,5'-Hexachlorobiphenyl .....	2.902 ± 0.059
2,2',3,4,4',5',6'-Heptachlorobiphenyl .....	2.879 ± 0.059
2,2',3,3',4,4',5,5'-Octachlorobiphenyl .....	2.889 ± 0.063

## Miscellaneous

Code	Product	Unit
<b>NIST-3452</b>	High-Temperature Seebeck Coefficient Standard (295 K to 900 K)	2.5 x 2.5 x 14.0 mm
	It is intended primarily for use in instrument validation and interlaboratory data comparison in the temperature range of 295 K to 900 K to support the research, development, and production of materials and devices related to thermoelectric based energy conversion applications.	
	$S_m(T) = S_A + a(T-295) + b(T-295)^2$	
	$S_A = 1.162\ 467\ 64 \times 10^2 \quad \mu\text{V/K},$	
	$a = 2.343\ 158 \times 10^{-1} \quad \mu\text{V/K}^2$	
	$b = -8.781\ 594 \times 10^{-5} \quad \mu\text{V/K}^3$	

---

