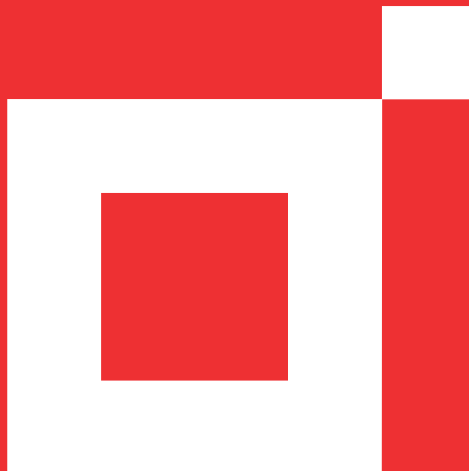




Potvrda o akreditaciji Accreditation Certificate

Ovime se utvrđuje da je
This is to recognize that

Državni hidrometeorološki zavod
Ravnice 48, HR-10000 Zagreb
Služba kemijski laboratorij
Avenija V. Holjevca 20, HR-10000 Zagreb

osposobljen prema zahtjevima norme
is competent according to
HRN EN ISO/IEC 17025:2017
(ISO/IEC 17025:2017;
EN ISO/IEC 17025:2017)
za/to carry out

Ispitivanje oborine i vanjskog zraka
Testing of precipitation and ambient air

u području opisanom u prilogu koji je sastavni dio ove potvrde o akreditaciji.
for the scope described in the annex which is the constituent part of this accreditation certificate.

Br./No.: 1427
Klasa/Ref.No.: 383-02/23-30/004
Urbroj/Id.No.: 569-05/3-23-52
Zagreb, 2023-07-24

Akreditacija istječe-Accreditation expiry: 2028-07-23
Prva akreditacija-Initial accreditation: 2013-07-24

HAA je potpisnica multilateralnog sporazuma s Europskom organizacijom za akreditaciju (EA)
HAA is a signatory of the European co-operation for Accreditation (EA) Multilateral Agreement

Ravnateljica:
Director General:
mr. sc. Mirela Zečević



HAA

Hrvatska akreditacijska agencija
Croatian Accreditation Agency

PRILOG POTVRDI O AKREDITACIJI br: 1427*Annex to Accreditation Certificate Number:*

Klasa/Ref. No.: 383-02/23-30/004

Urbroj/Id. No.: 569-05/3-26-10

Datum izdanja priloga /Annex Issued on: 2026-03-12

Klasa/Ref. No.: 383-02/23-30/004

Urbroj/Id. No.: 569-05/3-24-29

Datum izdanja priloga /Annex Issued on: 2024-11-08

Norma: HRN EN ISO/IEC 17025:2017*Standard: (ISO/IEC 17025:2017; EN ISO/IEC 17025:2017)***Akreditacija istječe: 2028-07-23***Accreditation expiry:***Prva akreditacija: 2013-07-24***Initial accreditation:***Akreditirani laboratorij***Accredited Laboratory***Državni hidrometeorološki zavod**

Ravnice 48, HR-10000 Zagreb

Služba kemijski laboratorij

Avenija V. Holjevca 20, HR-10000 Zagreb

Područje akreditacije:*Scope of Accreditation:***Ispitivanje oborine i vanjskog zraka***Testing of precipitation and ambient air*

Važeće izdanje Priloga dostupno je na web adresi: www.akreditacija.hr /
Valid issue of the Annex is available at the web address: www.akreditacija.hr

Ravnateljica:*Director General:***mr. sc. Mirela Zečević**

PODRUČJE AKREDITACIJE / SCOPE OF ACCREDITATION

Br. No.	Materijali/Proizvodi Materials/Products	Vrsta ispitivanja/Svojstvo Type of test/Property Raspon/Range	Metoda ispitivanja Test method																				
1.	Oborina Precipitation	Određivanje otopljenih glavnih iona u oborini ionskom kromatografijom <i>Determination of main ion concentrations by ion chromatography</i> raspon/range: <table><tr><th>analit/analyte</th><th>c / (mg L⁻¹)</th></tr><tr><td>Cl⁻</td><td>0,030 – 100</td></tr><tr><td>NO₃⁻-N</td><td>0,034 – 10,0</td></tr><tr><td>SO₄²⁻-S</td><td>0,030 – 10,0</td></tr><tr><td>PO₄³⁻-P</td><td>0,029- 10,0</td></tr><tr><td>Na⁺</td><td>0,030 – 100</td></tr><tr><td>NH₄⁺-N</td><td>0,023 – 7,00</td></tr><tr><td>K⁺</td><td>0,030 – 10,0</td></tr><tr><td>Mg²⁺</td><td>0,030 – 8,00</td></tr><tr><td>Ca²⁺</td><td>0,030 – 20,0</td></tr></table>	analit/analyte	c / (mg L ⁻¹)	Cl ⁻	0,030 – 100	NO ₃ ⁻ -N	0,034 – 10,0	SO ₄ ²⁻ -S	0,030 – 10,0	PO ₄ ³⁻ -P	0,029- 10,0	Na ⁺	0,030 – 100	NH ₄ ⁺ -N	0,023 – 7,00	K ⁺	0,030 – 10,0	Mg ²⁺	0,030 – 8,00	Ca ²⁺	0,030 – 20,0	HRN EN ISO 10304-1:2009 (ISO 10304-1:2007; EN ISO 10304-1:2009) HRN EN ISO 14911:2001 (ISO 14911:1998; EN ISO 14911:1999)
analit/analyte	c / (mg L ⁻¹)																						
Cl ⁻	0,030 – 100																						
NO ₃ ⁻ -N	0,034 – 10,0																						
SO ₄ ²⁻ -S	0,030 – 10,0																						
PO ₄ ³⁻ -P	0,029- 10,0																						
Na ⁺	0,030 – 100																						
NH ₄ ⁺ -N	0,023 – 7,00																						
K ⁺	0,030 – 10,0																						
Mg ²⁺	0,030 – 8,00																						
Ca ²⁺	0,030 – 20,0																						
2.	Vanjski zrak- lebdeće čestice (PM _{2,5}) Ambient air-suspended particulate matter (PM _{2,5})	Određivanje glavnih iona u frakciji lebdećih čestica PM_{2,5} ionskom kromatografijom <i>Determination of main ion concentrations in PM_{2,5} particle fraction by ion chromatography</i> raspon/range: <table><tr><th>analit/analyte</th><th>c / (µg m⁻³)</th></tr><tr><td>Cl⁻</td><td>0,00909 – 1,82</td></tr><tr><td>NO₃⁻</td><td>0,0456 – 24,14</td></tr><tr><td>SO₄²⁻</td><td>0,0272 – 16,33</td></tr><tr><td>Na⁺</td><td>0,00545 – 1,82</td></tr><tr><td>NH₄⁺</td><td>0,00545 – 7,03</td></tr><tr><td>K⁺</td><td>0,00545 – 1,82</td></tr><tr><td>Mg²⁺</td><td>0,00545 – 1,82</td></tr><tr><td>Ca²⁺</td><td>0,00545 – 1,82</td></tr></table>	analit/analyte	c / (µg m ⁻³)	Cl ⁻	0,00909 – 1,82	NO ₃ ⁻	0,0456 – 24,14	SO ₄ ²⁻	0,0272 – 16,33	Na ⁺	0,00545 – 1,82	NH ₄ ⁺	0,00545 – 7,03	K ⁺	0,00545 – 1,82	Mg ²⁺	0,00545 – 1,82	Ca ²⁺	0,00545 – 1,82	HRI CEN/TR 16269:2017 (CEN/TR 16269:2011)		
analit/analyte	c / (µg m ⁻³)																						
Cl ⁻	0,00909 – 1,82																						
NO ₃ ⁻	0,0456 – 24,14																						
SO ₄ ²⁻	0,0272 – 16,33																						
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Br. No.	Materijali/Proizvodi Materials/Products	Vrsta ispitivanja/Svojstvo Type of test/Property Raspon/Range	Metoda ispitivanja Test method													
3.	Vanjski zrak- lebdeće čestice (PM ₁₀) Ambient air-suspended particulate matter (PM ₁₀)	Određivanje koncentracije benzo(a)pirena metodom plinske kromatografije vezane na spektrometriju masa (GC-MS) <i>Determination of benzo(a)pyrene concentration by gas chromatography linked to mass spectrometry(GC-MS)</i> raspon/ range: (0,03 – 1,53) ng m⁻³	HRN EN 15549:2008 (EN 15549:2008)													
4.		Određivanje koncentracije benzo[a]antracena, krizena, benzo[b+j+k]fluorantena, dibenzo[a,h]antracena, indeno[1,2,3-cd]pirena i benzo[g,h,i]perilena metodom plinske kromatografije vezane na spektrometriju masa (GC-MS) <i>Determination of concentration of benz[a]anthracene, chrysene, benzo[b+j+k]fluoranthene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene and benzo[ghi]perylene by gas chromatography linked to mass spectrometry (GC-MS)</i> raspon/range: <table><tr><th>Analit/Analyte</th><th>c / (ng m⁻³)</th></tr><tr><td>benzo(a)antracen <i>benz[a]anthracene</i></td><td>0,05 – 1,53</td></tr><tr><td>krizen <i>chrysene</i></td><td>0,05– 1,56</td></tr><tr><td>benzo(b+j+k)fluoranten <i>benzo[b+j+k]fluoranthene</i></td><td>0,06 – 7,65</td></tr><tr><td>dibenzo(a,h)antracen <i>dibenz[a,h]anthracene</i></td><td>0,03 – 3,15</td></tr><tr><td>indeno(1,2,3-cd)piren <i>indeno[1,2,3-cd]pyrene</i></td><td>0,04 – 1,55</td></tr><tr><td>benzo(g,h,i)perilen <i>benzo[ghi]perylene</i></td><td>0,05 – 2,93</td></tr></table>	Analit/Analyte	c / (ng m ⁻³)	benzo(a)antracen <i>benz[a]anthracene</i>	0,05 – 1,53	krizen <i>chrysene</i>	0,05– 1,56	benzo(b+j+k)fluoranten <i>benzo[b+j+k]fluoranthene</i>	0,06 – 7,65	dibenzo(a,h)antracen <i>dibenz[a,h]anthracene</i>	0,03 – 3,15	indeno(1,2,3-cd)piren <i>indeno[1,2,3-cd]pyrene</i>	0,04 – 1,55	benzo(g,h,i)perilen <i>benzo[ghi]perylene</i>	0,05 – 2,93
Analit/Analyte	c / (ng m ⁻³)															
benzo(a)antracen <i>benz[a]anthracene</i>	0,05 – 1,53															
krizen <i>chrysene</i>	0,05– 1,56															
benzo(b+j+k)fluoranten <i>benzo[b+j+k]fluoranthene</i>	0,06 – 7,65															
dibenzo(a,h)antracen <i>dibenz[a,h]anthracene</i>	0,03 – 3,15															
indeno(1,2,3-cd)piren <i>indeno[1,2,3-cd]pyrene</i>	0,04 – 1,55															
benzo(g,h,i)perilen <i>benzo[ghi]perylene</i>	0,05 – 2,93															

Br. No.	Materijali/Proizvodi <i>Materials/Products</i>	Vrsta ispitivanja/Svojstvo <i>Type of test/Property</i> <i>Raspon/Range</i>	Metoda ispitivanja <i>Test method</i>													
5.	Vanjski zrak <i>Ambient air</i>	Određivanje masene koncentracije PM₁₀ i PM_{2,5} frakcije lebdećih čestica <i>Determination of mass concentration of PM₁₀ and PM_{2,5} particle fraction</i> raspon/range: PM₁₀: (1 – 150) µg m⁻³ PM_{2,5}: (1 – 120) µg m⁻³	HRN EN 12341:2023 (<i>EN</i> <i>12341:2023</i>)													
6.	Oborina Precipitation	Određivanje policikličkih aromatskih ugljikovodika u oborini metodom plinske kromatografije (GC-MS/MS) <i>Determination of the deposition of polycyclic aromatic hydrocarbons concentration by gas chromatography linked to mass spectrometry (GC-MSMS)</i> <table><tr><th>Analit/<i>Analyte</i></th><th>Raspon / <i>Range</i> depozicija (ng m⁻² d⁻¹)</th></tr><tr><td>benzo[a]antracen <i>benz[a]anthracene</i></td><td rowspan="10">(4,37 – 582,35)</td></tr><tr><td>krizen chrysene</td></tr><tr><td>benzo[b]fluoranten <i>benzo[b]fluoranthene</i></td></tr><tr><td>benzo[k]fluoranten <i>benzo[k]fluoranthene</i></td></tr><tr><td>benzo[j]fluoranten <i>benzo[j]fluoranthene</i></td></tr><tr><td>benzo[a]piren <i>benzo[a]pyrene</i></td></tr><tr><td>indeno[1,2,3-cd]piren <i>indeno[1,2,3-cd]pyrene</i></td></tr><tr><td>dibenzo[a,h]antracen <i>dibenz[a,h]anthracene</i></td></tr><tr><td>benzo[g,h,i]perilen <i>benzo[g,h,i]perylene</i></td></tr><tr><td></td></tr></table>	Analit/ <i>Analyte</i>	Raspon / <i>Range</i> depozicija (ng m ⁻² d ⁻¹)	benzo[a]antracen <i>benz[a]anthracene</i>	(4,37 – 582,35)	krizen chrysene	benzo[b]fluoranten <i>benzo[b]fluoranthene</i>	benzo[k]fluoranten <i>benzo[k]fluoranthene</i>	benzo[j]fluoranten <i>benzo[j]fluoranthene</i>	benzo[a]piren <i>benzo[a]pyrene</i>	indeno[1,2,3-cd]piren <i>indeno[1,2,3-cd]pyrene</i>	dibenzo[a,h]antracen <i>dibenz[a,h]anthracene</i>	benzo[g,h,i]perilen <i>benzo[g,h,i]perylene</i>		HRN EN 15980:2011 (<i>EN</i> <i>15980:2011</i>)
Analit/ <i>Analyte</i>	Raspon / <i>Range</i> depozicija (ng m ⁻² d ⁻¹)															
benzo[a]antracen <i>benz[a]anthracene</i>	(4,37 – 582,35)															
krizen chrysene																
benzo[b]fluoranten <i>benzo[b]fluoranthene</i>																
benzo[k]fluoranten <i>benzo[k]fluoranthene</i>																
benzo[j]fluoranten <i>benzo[j]fluoranthene</i>																
benzo[a]piren <i>benzo[a]pyrene</i>																
indeno[1,2,3-cd]piren <i>indeno[1,2,3-cd]pyrene</i>																
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Br. No.	Materijali/Proizvodi <i>Materials/Products</i>	Vrsta ispitivanja/Svojstvo <i>Type of test/Property</i> <i>Raspon/Range</i>	Metoda ispitivanja <i>Test method</i>												
7.	Vanjski zrak- plinovita faza i lebdeće čestice <i>Ambient air- gas and particle phase</i>	Određivanje policikličkih aromatskih ugljikovodika u zraku metodom plinske kromatografije (GC-MS/MS) <i>Determination of total polycyclic aromatic hydrocarbons-collection in air with gas chromatographic/mass spectrometric analyses (GC-MSMS)</i> <table><tr><th>Analit/<i>Analyte</i></th><th><i>c</i> (ng m⁻³)</th></tr><tr><td>benzo[a]antracen <i>benz[a]anthracene</i></td><td rowspan="9">0,08</td></tr><tr><td>krizen <i>chrysene</i></td></tr><tr><td>benzo[b]fluoranten <i>benzo[b]fluoranthene</i></td></tr><tr><td>benzo[k]fluoranten <i>benzo[k]fluoranthene</i></td></tr><tr><td>benzo[j]fluoranten <i>benzo[j]fluoranthene</i></td></tr><tr><td>benzo[a]piren <i>benzo[a]pyrene</i></td></tr><tr><td>indeno[1,2,3-cd]piren <i>indeno[1,2,3-cd]pyrene</i></td></tr><tr><td>dibenzo[a,h]antracen <i>dibenz[a,h]anthracene</i></td></tr><tr><td>benzo[g,h,i]perilen <i>benzo[g,h,i]perylene</i></td></tr></table>	Analit/ <i>Analyte</i>	<i>c</i> (ng m ⁻³)	benzo[a]antracen <i>benz[a]anthracene</i>	0,08	krizen <i>chrysene</i>	benzo[b]fluoranten <i>benzo[b]fluoranthene</i>	benzo[k]fluoranten <i>benzo[k]fluoranthene</i>	benzo[j]fluoranten <i>benzo[j]fluoranthene</i>	benzo[a]piren <i>benzo[a]pyrene</i>	indeno[1,2,3-cd]piren <i>indeno[1,2,3-cd]pyrene</i>	dibenzo[a,h]antracen <i>dibenz[a,h]anthracene</i>	benzo[g,h,i]perilen <i>benzo[g,h,i]perylene</i>	PO-7.2.6, rev. 1 2024-01-19 modificirana/ <i>modified</i> HRN ISO 12884:2008 (ISO 12884:2000)
Analit/ <i>Analyte</i>	<i>c</i> (ng m ⁻³)														
benzo[a]antracen <i>benz[a]anthracene</i>	0,08														
krizen <i>chrysene</i>															
benzo[b]fluoranten <i>benzo[b]fluoranthene</i>															
benzo[k]fluoranten <i>benzo[k]fluoranthene</i>															
benzo[j]fluoranten <i>benzo[j]fluoranthene</i>															
benzo[a]piren <i>benzo[a]pyrene</i>															
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dibenzo[a,h]antracen <i>dibenz[a,h]anthracene</i>															
benzo[g,h,i]perilen <i>benzo[g,h,i]perylene</i>															
8.	Vanjski zrak <i>Ambient air</i>	Određivanje ukupne taložne tvari (UTT) prema Bergerhoff metodi <i>Determination of the dust deposition according to the Bergerhoff method</i> Granica kvantifikacije/<i>Quantification limit</i> 4,6 mg m⁻² d⁻¹	VDI 4320 Part 2:2012												

Br. No.	Materijali/Proizvodi <i>Materials/Products</i>	Vrsta ispitivanja/Svojstvo <i>Type of test/Property</i> <i>Raspon/Range</i>	Metoda ispitivanja <i>Test method</i>																								
9.	Vanjski zrak <i>Ambient air</i>	Određivanje arsena, kadmija, olova i nikla u taložnoj tvari primjenom induktivno spregnute plazme sa spektrometrijom masa <i>Determination of arsenic, cadmium, lead and nickel in atmospheric deposition by inductively coupled plasma with mass spectrometry</i> Granica kvantifikacije/<i>Quantification limit</i> As: 0,03 µg m⁻² d⁻¹ Cd: 0,06 µg m⁻² d⁻¹ Pb: 0,49 µg m⁻² d⁻¹ Ni: 0,08 µg m⁻² d⁻¹	HRN EN 15841:2010 (EN 15841:2009)																								
10.	Vanjski zrak <i>Ambient air</i>	Određivanje anorganskih komponenti ionskom kromatografijom u zraku uzorkovanom filterpack metodom <i>Determination of inorganic components by ion chromatography in air sampled using the filterpack method</i> raspon/range: <table><tr><th>analit/<i>analyte</i></th><th>c (µg/m³)</th></tr><tr><td>Cl⁻</td><td>(0,00992 - 2,98) µg/m³</td></tr><tr><td>NO₃⁻</td><td>(0,0112 - 4,48) µg N/m³</td></tr><tr><td>SO₄²⁻</td><td>(0,00998 - 3,99) µg S/m³</td></tr><tr><td>Na⁺</td><td>(0,00595 - 1,98) µg/m³</td></tr><tr><td>NH₄⁺</td><td>(0,00462 - 3,09) µg N/m³</td></tr><tr><td>K⁺</td><td>(0,00595 - 1,98) µg/m³</td></tr><tr><td>Mg²⁺</td><td>(0,00595 - 1,98) µg/m³</td></tr><tr><td>Ca²⁺</td><td>(0,00595 - 1,98) µg/m³</td></tr><tr><td>HNO₃</td><td>(0,0112 - 4,48) µg N/m³</td></tr><tr><td>SO₂</td><td>(0,00998 - 3,99) µg S/m³</td></tr><tr><td>NH₃</td><td>(0,00462 - 3,09) µg N/m³</td></tr></table>	analit/ <i>analyte</i>	c (µg/m ³)	Cl ⁻	(0,00992 - 2,98) µg/m ³	NO ₃ ⁻	(0,0112 - 4,48) µg N/m ³	SO ₄ ²⁻	(0,00998 - 3,99) µg S/m ³	Na ⁺	(0,00595 - 1,98) µg/m ³	NH ₄ ⁺	(0,00462 - 3,09) µg N/m ³	K ⁺	(0,00595 - 1,98) µg/m ³	Mg ²⁺	(0,00595 - 1,98) µg/m ³	Ca ²⁺	(0,00595 - 1,98) µg/m ³	HNO ₃	(0,0112 - 4,48) µg N/m ³	SO ₂	(0,00998 - 3,99) µg S/m ³	NH ₃	(0,00462 - 3,09) µg N/m ³	vlastita metoda <i>/in house method</i> PO-7.2.9, rev. 1 2025-03-28
analit/ <i>analyte</i>	c (µg/m ³)																										
Cl ⁻	(0,00992 - 2,98) µg/m ³																										
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