Purchase Contract

(hereafter the "**Contract**")

1. CONTRACTUAL PARTIES

1.1 **Geologický ústav AV ČR, v. v. i.,**

with its registered office at: Rozvojová 269, 165 00 Praha 6 – Lysolaje, Czech Republic
represented by: RNDr. Tomáš Přikryl, Ph.D., Director,
registered in the Register of public research institutions of the Ministry of Education, Youth and Sports of the Czech Republic.
ID No.: 67985831
Tax ID No.: CZ67985831

Bank: [redacted]
Account No. IBAN: [redacted]; SWIFT (BIC): [redacted]

(hereafter the "**Buyer**")

and

1.2 **Pragolab s.r.o.,**

with its registered office at: Nad Krocínkou 285/55, 190 00 Praha 9, Czech Republic
represented by: Be. Ladislav Náměstek, jednatel společnosti,
registered at Municipal Court in Prague, Section C, Entry 14590.
ID No: 48029289
Tax ID No.: CZ48029289

Bank: [redacted]
Account No. IBAN: [redacted]; SWIFT (BIC): [redacted]

(hereafter the "**Seller**"),

(the Buyer and the Seller are hereafter jointly referred to as the "**Parties**" and each of them individually as a "**Party**").

2. FUNDAMENTAL PROVISIONS

2.1 The Buyer is a public research institution whose primary activity is scientific research in the areas of structural geology, magnetostratigraphy, petrology, geochemistry of endogenous and exogenous processes, economic geology, phytopaleontology including microphytopaleontology, zoopaleontology of vertebrates and invertebrates and paleoecology, together with Quaternary geology, geoarchaeology and environmental sciences.

2.2 The Buyer wishes to acquire the subject of performance hereof for the purpose of resolving the concentration and isotope ratios of many chemical elements in a wide variety of sample media, to extremely low detection limits and wide concentration ranges.

2.3 The Seller was selected as the winner within **Part 1** of a public procurement procedure announced by the Buyer in accordance with Act No. 134/2016 Coll., on Public Procurement, as amended (hereafter the **"Act"**), for the public contract called **"HR ICP-MS with Excimer laser"** (hereafter the "**Procurement Procedure**").

2.4 The documentation necessary for the execution of the subject of performance hereof consist of

2.4.1 **Technical specifications** of the subject of performance hereof attached as **Annex 1** hereto**.**

2.4.2 The Seller´s bid submitted within the Procurement Procedure in its parts which describe the subject of performance in technical detail (hereafter the "**Seller's Bid**") as **Annex 2** hereto.

In the event of a conflict between the Contract and its Annexes or Annexes to each other, a technical requirement of a higher level or a business condition more favorable to the Buyer always takes precedence.

2.5 The Seller declares that he has all the professional prerequisites required for the supply of the subject of performance under this Contract, is authorised to supply the subject of performance and there exist no obstacles on the part of the Seller that would prevent him from supplying the subject of this Contract to the Buyer.

2.6 The Seller acknowledges that the production and delivery of the subject of performance within the specified time and of the specified quality, as shown in Annexes 1 and 2 of this Contract (including invoicing), is essential for the Buyer. If the Seller does not fulfil the contractual requirements, the Buyer may incur damages.

3. SUBJECT-MATTER OF THE CONTRACT

3.1 The subject of this Contract is the obligation on the part of the Seller to deliver and transfer into the Buyer's ownership:

the **High-resolution mass spectrometer for elemental and isotopic measurements using ion counter**

(hereafter the **"Equipment"**)

specified in detail in Annexes 1 and 2 hereto and the Buyer undertakes to take delivery of the Equipment and to pay to the Seller the agreed upon price.

3.2 The following activities form an integral part of the performance to be provided by the Seller:

3.2.1 Submission of a list containing conditions which are recommended to be met at the place of performance in order to install the Equipment;

3.2.2 Transport of the Equipment incl. all accessories specified in Annexes 1 and 2 of the Contract to the place of performance, un-packaging and control thereof;

3.2.3 Installation of the Equipment and its commissioning at the place of performance;

3.2.4 Testing of the Equipment in order to verify its functionality and compliance with the declared parameters listed in Annexes 1 and 2 of the Contract, according to the manufacturer's instructions;

3.2.5 Delivery of detailed instructions and manuals for operation and maintenance, including list of spare parts, etc. - all in Czech or English language, in electronic or hardcopy (printed) versions;

3.2.6 Basic training of operators focused on controlling the Equipment after its successful installation on site - at least 2 days (1 day = 8 hours) of training of 4 operators, extended on-site training during the first 6 months of Equipment operation - at least 3 days (1 day = 8 hours) of training of 4 operators;

3.2.7 Free-of-charge warranty service during the warranty period;

3.2.8 Provision of free technical support in the form of consultations, e.g. regarding fine tuning of the Equipment or its SW (The details of provision of this support after the warranty expires are described in Annex 1 hereto.);

3.2.9 Free software upgrades at least during the warranty period.

3.3 The Seller shall be liable for the Equipment and related services to be in full compliance with this Contract, its Annexes and all valid legal regulation, technical and quality standards and that the Buyer will be able to use the Equipment for the defined purpose. In case of any conflict between applicable standards it is understood that the stricter standard or its part shall always apply.

3.4 The delivered Equipment and all its parts and accessories must be brand new and unused.

4. PERFORMANCE PERIOD

4.1 The Seller undertakes to install the Equipment and hand it over to the Buyer within **4 months** of conclusion of the Contract.

4.2 The Seller is obliged to notify the Buyer of the date of delivery and installation of the Equipment at least 1 month in advance. This term is subject to the consent of the Buyer.

4.3 In the event that, due to obstacles on the part of the Buyer, it is not possible to deliver and hand over the Equipment on the agreed date or within the period according to Section 4.1, the Seller is not entitled to claim payment of any additional costs against the Buyer.

5. PURCHASE PRICE, INVOICING, PAYMENTS

5.1 The purchase price is based on the Seller's submitted bid and amounts to **11.200.000,- CZK** (in words: eleven millions two hundred thousand Czech crowns) excluding VAT (hereafter the **"Price"**). VAT shall be settled in accordance with the valid Czech regulation.

5.2 The Price includes any and all performance provided by the Seller in connection with meeting the Buyer's requirements for the proper and complete delivery of the Equipment hereunder, as well as all costs that the Seller may incur in connection with the delivery, installation and testing of the Equipment upon handover, and including all other costs or expenses that may arise in connection with the performance of the Contract.

5.3 The Parties agreed that the Seller shall be entitled to invoice the Price as follows:

5.3.1 The Seller is entitled to issue an advance invoice in the amount up to 30 % of the Price excluding VAT after the conclusion of the Contract.

5.3.2 The Seller is entitled to invoice the rest of the Price after the handover protocol in accordance with Section 9.4 (hereafter the **"Handover Protocol"**) will have been signed by the Buyer. In case the Equipment will be delivered with minor defects, the Price shall be invoiced after removal of these minor defects.

5.4 All invoices issued by the Seller must contain all information required by the applicable laws of the Czech Republic. Mandatory invoice details are as follows:

5.4.1 name and registered office of the Buyer,

5.4.2 tax identification number of the Buyer,

5.4.3 name and registered office of the Seller,

5.4.4 tax identification number of the Seller,

5.4.5 registration number of the invoice,

5.4.6 scope of the performance (including the reference to this Contract),

5.4.7 the date of the issue of the invoice,

5.4.8 purchase Price,

5.4.9 the date of conclusion of the Contract and its registration number, which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice,

and it must comply with the double taxation agreements, if applicable.

5.5 The Buyer prefers electronic invoicing with the invoices being delivered to uctarna@gli.cas.cz.

5.6 Invoices shall be payable within thirty (60) days of the date of their delivery to the Buyer. Payment of the invoiced amount means the date of its remittance to the Seller's account.

5.7 If an invoice is not issued in conformity with the payment terms stipulated by the Contract or if it does not comply with the requirements stipulated by law, the Buyer shall be entitled to return the invoice to the Seller as incomplete, or incorrectly issued, for correction or issuance of a new invoice, as appropriate, within five (5) business days of the date of its delivery to the Buyer. In such a case, the Buyer shall not be in delay with the payment of the Price or part thereof and the Seller shall issue a corrected or new invoice with a new and identical maturity period commencing on the date of delivery of the corrected or newly issued invoice to the Buyer.

5.8 The Buyer shall be entitled to unilaterally set off any of his payments against any receivables claimed by the Seller due to:

5.8.1 damages caused by the Seller,

5.8.2 contractual penalties.

5.9 The Seller shall not be entitled to set off any of his receivables against any part of the Buyer's receivable hereunder.

6. OWNERSHIP TITLE

Ownership of the Equipment and the associated risk of damage is transferred to the Buyer upon proper handover of the Equipment in accordance with Section 9.4 of the Contract.

7. PLACE OF PERFORMANCE

The place of performance (delivery, installation and handover of the Equipment) shall be the room No. 305 (third floor) in the premises of the Institute of Geology of the Czech Academy of Sciences at the address Rozvojová 269, 165 00 Praha 6 – Lysolaje, Czech Republic.

8. COOPERATION OF THE PARTIES

8.1 The Seller undertakes to notify the Buyer of any obstacles on his part, which may negatively influence proper and timely delivery and/or handover of the Equipment.

8.2 The Seller is obliged to notify the Buyer of inappropriate readiness of the place of performance, if possible.

9. DELIVERY, INSTALLATION, HANDOVER AND ACCEPTANCE

9.1 The Seller shall transport the Equipment at his own cost to the place of performance. If the shipment is intact, the Buyer shall issue delivery note for the Seller.

9.2 The Seller shall perform and document the installation of the Equipment and launch the tests according to Section 3.2.4 hereof in order to verify whether the Equipment is functional and meets the technical requirements of Annexes 1 and 2 hereof.

9.3 Handover shall include any and all technical documentation pertaining to the Equipment, user manuals and certificate of compliance of the Equipment and all its parts and accessories with approved standards.

9.4 The acceptance of the Equipment shall be completed in a joint handover procedure (with Part 2 of this public contract) confirmed by the Handover Protocol. The Handover Protocol shall contain the following mandatory information:

9.4.1 Information about the Seller, the Buyer and any subcontractors;

9.4.2 Description of the Equipment including description of all components and their serial / production numbers;

9.4.3 Description of executed tests according to Section 3.2.4 of the Contract and their results;

9.4.4 Confirmation of the basic operator training according to Section 3.2.6 hereof, including a list of participants and information on its extent;

9.4.5 List of technical documentation including manuals;

9.4.6 Eventually reservation of the Buyer regarding minor defects including the manner and deadline for their removal and

9.4.7 Signatures of the representatives of both Parties according to Sections 11.1 and 11.2 and the date thereof.

9.5 Handover of the Equipment does not release the Seller from liability for damage caused by its defects.

9.6 The Buyer shall not be obliged to accept Equipment, which would show defects (even those that do not - on their own or in connection with other defects - constitute an obstacle to the use of the Equipment). In this case, the Buyer shall issue a record containing the reason for his refusal to accept the Equipment.

9.7 Should the Buyer not exercise his right not to accept the Equipment with a defect, the Seller and the Buyer shall list all defects found in the Handover Protocol, including the manner and deadline for their removal. Should the Parties not be able to agree in the Handover Protocol on the deadline for removal of the defects, it shall be understood that all defects shall be removed / rectified within 7 days from the handover of the Equipment.

10. PROVISION OF TECHNICAL SUPPORT

In accordance with Section 3.2.8 hereof, the Seller is obliged to provide the Buyer with free consultations and technical support related to the Equipment during the warranty and post-warranty periods**.**

11. REPRESENTATIVES, NOTICES

11.1 The Seller authorized the following representatives to communicate with the Buyer in all matters relating to the Equipment delivery, installation and handover:

[redacted]

11.2 The Buyer authorized the following representatives to communicate with the Seller in all matters relating to the Equipment delivery, installation and handover:

[redacted]

11.3 The representatives according to Sections 11.1 and 11.2 can be changed by a unilateral written declaration of the Party delivered to the other Party.

11.4 All notifications made between the Parties pursuant to this Contract, unless otherwise specified in the Contract, must be delivered to the other Party in person (with confirmed receipt) or by registered post (to the Buyer's or Seller's address), or in some other form of registered post or electronic delivery incorporating electronic signature (qualified certificate) to uctarna@gli.cas.cz in case of the Buyer and to pragolab@pragolab.cz in case of the Seller.

11.5 In all technical and expert matters (discussions on the Equipment testing, notification of the need to provide warranty or post-warranty service, technical assistance etc.), electronic communication between technical representatives of the Parties will be acceptable using e-mails specified in Sections 11.1 and 11.2.

12. TERMINATION

12.1 This Contract may be terminated early by agreement of the Parties or by withdrawal from the Contract on the grounds stipulated by law or in the Contract.

12.2 The Buyer is entitled to withdraw from the Contract without any penalty from the Seller in any of the following events:

12.2.1 The Seller is in delay with the delivery of the Equipment longer than 1 month after the date pursuant to Section 4.1 hereof.

12.2.2 The technical parameters or other conditions set out in the technical specifications defined in Annexes 1 and 2 to this Contract and in the relevant applicable technical standards will not be met by the Equipment at handover.

12.2.3 The Seller is more than 2 weeks in delay with the removal of Equipment defects listed in the list of detected defects of the Handover Protocol according to Section 9.7.

12.2.4 Facts emerge bearing evidence that the Seller will not be able to deliver and/or hand over the Equipment.

12.2.5 The Seller has breached the obligations specified within the conditions of the Procurement Procedure, in particular the obligations arising from the affidavit which forms Annex 3 to this Contract, necessary for the selection of an economic operator according to Section 2.3 of this Contract.

12.3 The Seller is entitled to withdraw from the Contract in the event of the Buyer being in default with the payment for more than 1 month with the exception of the cases when the Buyer refused an invoice due to defect on the delivered Equipment or due to breach of the Contract by the Seller.

12.4 Withdrawal from the Contract becomes effective on the day the written notification to that effect is delivered to the other Party. The Party which had received performance from the other Party prior to such withdrawal shall duly return such performance within 30 days from the date of sending the notification of withdrawal by the withdrawing Party, unless the withdrawing Party sets a longer period.

12.5 In the event of early termination of the Contract, the Seller is obliged to ensure the removal of the Equipment from the place of performance within 30 days from the date on which withdrawal from the Contract became effective. The Buyer will provide the Seller with the necessary cooperation similar to the cooperation during the installation of the Equipment. The cost of removal shall be paid by the Party which caused the premature termination of the Contract by breaching it.

13. INSURANCE

13.1 The Seller undertakes to insure the Equipment against all risks, in the amount of the Price for the entire period commencing when transport of the Equipment starts until duly handed over to the Buyer. In the case of breach of this obligation, the Seller shall be liable to the Buyer for any damage that may arise in connection thereof.

13.2 The Seller is liable for the damage that he has caused. The Seller is also liable for damage caused by third parties undertaken to carry out performance or its part under this Contract.

14. WARRANTY TERMS

14.1 The Seller shall provide warranty for the quality of the Equipment and all its accessories for a period of **24 months**.

14.2 The warranty period shall commence on the day following the date of signing of the Handover Protocol pursuant to Section 9.4 hereof. The warranty does not cover consumable parts. Consumable parts for the purposes of the Contract are understood as items contained within the Equipment, which are consumed at regular intervals during the normal use of the Equipment, i.e. parts which have a defined typical lifetime, that does not exceed the warranty period provided the Equipment is used with normal frequency.

14.3 The Seller undertakes to provide free servicing of the Equipment through authorized technicians and free regular service inspection at the place of performance to the extent specified by the Equipment manufacturer and by the Contract for the entire warranty period according to this Contract, including repairs, delivery of spare parts, transport and work of an authorized service technician further specified in Annex 1 hereto.

14.4 Should the Buyer discover a defect, he shall notify the Seller to rectify such defect using the e-mail address: servis@pragolab.cz. The Seller is obliged to notify the Buyer without delay about any change of this e-mail address.

14.5 The Seller shall be obliged to review any warranty claim within 48 hours (within business days) from its receipt and to propose solution. In case the nature of the claimed defect requires to be dealt with by a

qualified technician, such person must be sent and must appear at the place of performance within 5 business days from receipt of the above-mentioned warranty claim. All the above remains in effect unless agreed otherwise by the Parties. During the warranty period, the Seller shall be obliged to rectify any claimed defects within 15 days from receipt of the Buyer's notification. In cases of unusual defects, the Seller shall be obliged to rectify the defect in the period corresponding to the nature of the defect and to define the deadline for the handover of the rectified Equipment.

14.6 During the warranty period, any and all costs associated with defect rectification / repair including transport and travel expenses of the Seller shall be always borne by the Seller.

14.7 The repaired Equipment shall be handed over by the Seller to the Buyer on the basis of a protocol confirming removal of the defect (hereinafter the "**Repair Protocol**"). If the Equipment is delivered duly repaired and defect-free, the Buyer will confirm the Repair Protocol.

14.8 The repaired portion of the Equipment shall be subject to a new warranty term in accordance with Section 14.1 which commences to run on the day following the date when the Repair Protocol was executed. At the same time, the aggregate length of the warranty period of the repaired portion of the Equipment shall be a maximum of twice the warranty period according to Section 14.1.

14.9 If the Equipment shows defects for which it cannot be demonstrably used to its full extent for more than 60 days (defect period) during six or fewer consecutive months of the warranty period, the Seller is obliged to eliminate the defect by delivering a new Equipment without defects within a period of 60 days from receipt of the Buyer's notification, unless the Parties agree otherwise.

14.10 The Seller undertakes to provide paid post-warranty [out-of-warranty] service at the place of performance, including repairs, delivery of spare parts and transport and work of a service technician further specified in Annex 1 hereto, under the conditions of Sections 14.4 and 14.5 and at a price not exceeding the usual price also for a minimum period of 7 years after the expiration of the warranty.

15. CONTRACTUAL PENALTIES

15.1 The Buyer shall have the right to a penalty in the amount of 0.1 % of the Price for each commenced day of delay with the performance pursuant to Sections 4.1 and 14.9 hereof.

15.2 The Buyer shall have the right to a penalty in the amount of 2.500,00 CZK for each commenced day of delay with rectifying of defects claimed pursuant to Section 14.4 and 14.10 hereof.

15.3 In the event of withdrawal from the Contract due to the reason according to Section 12.2.2 hereof, the Buyer is entitled to apply a contractual penalty in the amount of 10 % of the Price against the Seller.

15.4 In the event that the Seller has committed to provide service support through a Czech-speaking technician in his Bid and does not fulfil this obligation, the Buyer has the right to a penalty in the amount of 15.000,00 CZK for each such case of non-fulfilment.

15.5 In the case of default in payment of any due receivables (monetary debt) under the Contract, the defaulting Buyer or Seller (the debtor) shall be obliged to pay a contractual penalty in the amount of 0.1 % of the owed amount for each commenced day of delay with the payment.

15.6 Contractual penalties are payable within 30 days of notification demanding payment thereof.

15.7 Payment of the contractual penalty does not prejudice the rights of the Parties to claim damages.

15.8 Payment of any contractual penalty cannot be demanded if the breach of the contractual obligation causes force majeure.

16. DISPUTES

In the event that any dispute cannot be resolved by negotiations, the dispute shall be resolved by the competent court in the Czech Republic based on application of any of the Parties; the court having jurisdiction will be the court where the seat of the Buyer is located. Disputes shall be resolved exclusively by the law of the Czech Republic.

17. FINAL PROVISIONS

17.1 This Contract may be changed or supplemented solely by means of numbered amendments in writing, furnished with the details of time and place and signed by duly authorised representatives of the Parties. The Parties expressly reject modifications to the Contract in any other manner.

17.2 The Parties agree that the Contract as a whole, including all attachments, will be published in accordance with Act No. 340/2015 Coll. on special conditions for the effectiveness of some contracts, publication of these contracts and Contract Register, as amended. The Buyer shall ensure the publication of the Contract.

17.3 This Contract becomes effective as of the day of its publication in the Contract Register.

17.4 The following Annexes form an integral part of the Contract:

Annex 1: Technical specification on the subject of performance

Annex 2: Technical description of the Equipment as presented in Seller's bid

Annex 3: Affidavit according to § 6 paragraph 4 of the Act No. 134/2016 Coll.

17.5 The Parties declare that they have read the Contract, understand its content and agree with it, as proof of which they attach their signatures.

In Prague 26. 6. 2024	In Prague 21. 6. 2024
For the Buyer:	For the Seller:
_____	_____
RNDr. Tomáš Přikryl, Ph.D.	Bc. Ladislav Náměstek
Director	Managing Director (jednatel společnosti)

Annex 1 - Technical specification on the subject of performance

Tab. 1 – The Equipment must meet the technical conditions and include components listed in this table.

No.	Description and minimum specification of the Equipment as defined by the Buyer	Description and specification of the Equipment offered by the Seller	Complies YES/NO
A	**Instrument**		
1	Simultaneous trace element and isotopic analyses using wet and dry plasma conditions	Thermo Scientific Element XR HR ICP MS provides ultra-sensitive and reliable multi element analysis for major and trace element analysis in one method. The high sensitivity of the Element Series (with optional Jet Interface for enhanced sensitivity) allows high precision isotope ratio measurements. Physical elimination of spectral interferences; no use of reactive gases. Routine and quick use of high resolution. Plasma and interface The ion source and interface of the Element XR High Resolution ICP-MS are at ground potential to enable a straightforward coupling of Laser Ablation and chromatography techniques like HPLC, CE, GC. The interface and the ion transfer optics focusing the ion beam onto the high-resolution slit are designed for optimized sensitivities at all resolutions. This results in very low background, highest sensitivity, and minimum mass bias at maximum stability. Hot and Cold plasma modes can be used routinely from the same sample vial for semiconductor applications.	**Yes**
2	Instrumental sensitivity at standard conditions (wet-plasma, nebulizer 50 microliters/min, double-pass type quartz spray chamber, production of $^{238}UO/^{238}U < 0.1$): > $1x10^9$/ppm ^{115}In	Wet plasma, Jet interface, Nebuliser 190 µL/min Twinnibar type quartz cyclonic spray chamber, 5.5 *106 cps/ppb 115In = 1.44 x10^6 cps/ppb equivalent to 1.44 $x10^9$/ppm ^{115}In AN30824 Element – Long term multi element signal stability AN 30824	**Yes**

3	Mass resolution from 300 to 10000 or more (m/z)	The Element XR HR-ICP-MS fully automatically change between three fixed resolutions by switching the positions of the entrance and exit slits in < 1 s. The design of the fixed slit mechanism offers maximum stability and reproducibility of resolutions. Even in high resolution mode, the intrinsic sensitivity of the Element XR HR-ICP-MS instruments provides sub ppt detection limits. ***Mass resolution 300, 4000, 10000 (10% valley, equivalent to 5% height)*** Element Series HR-ICP-MS Product Spec Sheet Page 4	**Yes**
4	Mass stability < 25 ppm during at least 8 hours (m/z 237/238)	< 25 ppm drift in 8 hours operation - Element Series HR-ICP-MS Product Spec Sheet Page 4	**Yes**
5	Signal stability < 2 % RSD during at least 1 hour	Signal stability <2% RSD over 1 hour - Element Series HR-ICP-MS Product Spec Sheet Page 4 Jet interface significantly increases the sensitivity across the mass range and at all resolution modes. The Jet Interface not only significantly increases the sensitivity of trace elemental analysis in wet plasma conditions, but also reproduced or improved the long term (2 hour) signal stability. The long term (2 hour) stability monitored in several experiments by measuring a suite of 26 isotopes in a 1 ppb multi-element solution with an Element XR HR-ICP-MS in LR, MR and HR were consistently < 1.5% RSD. ***Signal stability - <1.5% RSD*** AN30824 Element – Long term multi element signal stability an 30824	**Yes**
6	Magnet scan speed (m/z from 7 to 238 and back to 7) < 150 ms	m/z 7 to 238 to 7 <150ms - Element Series HR-ICP-MS Product Spec Sheet Page 4	**Yes**
7	Minimal requested vacuum reached in analyser region: < 5 x 10^{-7} mBar	The HiPace 80 pump reaches a pressure of arounf ~ 2×10-7 mbar within the 4th and 5th stage of the instrument. - Element XR Operating Manual page 56	**Yes**
8	Oxide formation (BaO^+/Ba^+) < 0.2 %	Oxide formation BAO/Ba+ < 0.002 - Element Series HR-ICP-MS Product Spec Sheet Page 4	**Yes**
B	**Accessories**		

9	PFA nebulizers (2 x 50 microliters/min, 2 x 30 microliters/min, 1 x 100 microliters/min)	1135450 PFA Microconcentric nebulizer for organic matrix inlet system (50 µL/min) 1083921 PFA Microconcentric nebulizer for organic matrix inlet system (20 µL/min) 1083911 "PFA Microconcentric nebulizer for acid-resistant inlet system and standard inlet system (100 µL/min)"	**Yes**
10	Double-pass type spray chamber, quartz glass, 1 piece	1127121 Stable introduction system for high precision measurements (isotope ratios) - Provides better precision for isotope ratio determination.	**Yes**
11	Integrated (in-line) autosampler fully compatible with the instrument and its software including accessories (blocks, standings etc. for 50, 25, 10, 5 and 2 ml tubes)	1238590 ESI Autosampler SC-2 DX without FAST	**Yes**
12	3 x set of Ni cones with Cu-based core (skimmer and sampler)	1260630 Jet Sample cone, nickel 1067600 Skimmer cone, nickel	**Yes**
13	1 x set of Pt cones (skimmer and sampler)	1067501 Sample cone, platinum 1047461 Skimmer cone, platinum	**Yes**
14	1 x Peristaltic pump integrated with ICP-MS	Integrated within Element XR system	**Yes**
15	2 x quartz torch + bonnet	1091250 Torch ELEMENT	**Yes**
16	3 x injectors (2 pieces from quartz, 1 piece from sapphire)	1161910 Quartz injector for standard torch (2.2 mm i.d.) 1091260 Sapphire injector for standard torch	**Yes**
17	PC system (including 2 x LCD monitors) controlling the intrument including all necessary software for data reduction and export	Included within system	**Yes**
18	PFA nebulizers (2 x 50 microliters/min, 2 x 30 microliters/min, 1 x 100 microliters/min)	Provided in B9	**Yes**
C	**Minimal analytical requirements**		
19	Measurement of $^{235}U/^{238}U$ ratios in solution with > 3 ppb of total U - internal and external precision (1 SD) in samples (n=10) using standard conditions (wet-plasma, nebulizer 50 microliters/min, double-pass type quartz spray chamber, production of $^{238}UO/^{238}U < 0.1$): ≤ 0.1 % RSD	Measurements were carried out using an Element XR HR-ICP-MS equipped with the quartz stable sample introduction system (SIS, Thermo Scientific PN 1127121), which is the spray chamber to be used when measuring isotope ratios with best precision. The SIS was combined with a 50 microliters/min PFA nebulizer, a 2.2 mm internal diameter injector (standard on the Element XR), standard Ni sample cone, H Ni skimmer cone. A standard Uranium solution was free-aspirated (NBS UO10, 10 ppb in 3% HNO3 matrix). 10 replicate sample measurements were carried out in wet plasma, low resolution mode (LR = 300), each measuring 235U and	**Yes**

		238U m/z (mass-to-charge ratio) for a total measurement time of 1.5 minute per replicate. The 235U/238U ratio was calculated by the Element SW for each sample. The 235U/238U isotope ratio average (calculated offline) of the 10 replicates was 0.010175 and the 1RSD was 0.06% (internal precision). The external precision was determined by measuring 3 x 10 replicates over two different days. The plasma was shut down after the first day and the operating parameters re-tuned at the beginning of the second day. The sample introduction system and measurement conditions were the same for both days. The 235U/238U isotope ratio average (calculated offline) of the 30 replicates was 0.010187 and the 1RSD was 0.10% (external precision). 238UO/238U was < 0.03 during the first day and < 0.04 during the second day. Sensitivity was 2.3 x 106 counts per second /ppb 238U during the first day and 2.0 x 106 counts per second/ppb 238U during the second day. No external mass fractionation correction (by normalization to a standard solution) was applied.	
20	Measurement of $^{185}Re/^{187}Re$ ratios in solution with > 3 ppb of total Re - internal and external precision (1 SD) in samples (n=10) using standard conditions (wet-plasma, nebulizer 50 microliters/min, double-pass type quartz spray chamber, production of $^{238}UO/^{238}U$ < 0.1): ≤ 0.2 % RSD	Measurements were carried out using an Element XR HR-ICP-MS equipped with the quartz stable sample introduction system (SIS, Thermo Scientific PN 1127121), which is the spray chamber to be used when measuring isotope ratios with best precision. The SIS was combined with a 50 microliters/min PFA nebulizer, a 2.2 mm internal diameter injector (standard on the Element XR), standard Ni sample cone, H Ni skimmer cone. A 10 ppb Rhenium solution (in ultra-pure H2O matrix) was free-aspirated. 10 replicate sample measurements were carried out in wet plasma, low resolution mode (LR = 300), each measuring 185Re and 187Re m/z (mass-to-charge) for a total measurement time of 1.5 minute per replicate. The 185Re/187Re ratio was calculated by the Element SW for each sample. The 185Re/187Re isotope ratio average (calculated offline) of the 10 replicates was	**Yes**

		0.597741 and the 1RSD was 0.03% (internal precision). The external precision was determined by measuring 3 x 10 replicates over two different days. The plasma was shut down after the first day and the operating parameters re-tuned at the beginning of the second day. The sample introduction system and measurement conditions were the same for both days. The 185Re/187Re isotope ratio average (calculated offline) of the 30 replicates was 0.598510 and the RSD was 0.10 % (external precision). 238UO/238U was < 0.03 during the first day and < 0.04 during the second day. Sensitivity was 2.3 x 106 counts per second/ppb 238U during the first day and 2.0 x 106 counts per second/ppb 238U during the second day. No external mass fractionation correction (by normalization to a standard solution) was applied.	

Tab. 2 – Data on the evaluation criteria

TECHNICAL PARAMETERS		
No.	**Parameter**	**Value**
1.	Enhanced sensitivity of the instrument during standard conditions (wet-plasma, nebulizer 50 microliters/min, double-pass type quartz spray chamber, production of $^{238}UO/^{238}U < 0.1) > 4x10^9$/ppm ^{115}	**YES** ($5.5x10^6$ cps/ppb In^{115} @190µL/min =$1.44x10^9$ cps/ppm @50 µL/min. Ref AN30824 Table 1)
2.	Fast (< 400 ms) and simultaneous scanning across the high mass range (resolution 300 - ^{23}Na to ^{197}Au, resolution 4000 - ^{44}Ca to ^{238}U). ***Fast scanning in Low Resolution (R = 300) across the mass range*** *Special specification: the total scan cycle time in Low Resolution (R=300) required to measure ^{23}Na, ^{45}Sc, ^{59}Co, ^{89}Y, ^{197}Au including the necessary magnet settling times is* ***≤400 ms,*** *with a duty cycle < 70%*	**YES** (the total scan cycle time in Low Resolution (R=300) required to measure ^{23}Na, ^{45}Sc, ^{59}Co, ^{89}Y, ^{197}Au **including** the necessary magnet settling times is *≤400 ms,* with a duty cycle < 70%. Fast scanning in Medium Resolution (R=4000) across the mass range with

	Fast scanning in Medium Resolution (R=4000) across the mass range with high mass stability (wet plasma) *Special specification: it is possible to measure ^{44}Ca, ^{56}Fe and ^{238}U in Medium Resolution (R=4000) in* ***≤ 300 ms with RSD of the peak centroids ≤ 12 ppm for all 3 isotopes***	high mass stability (wet plasma) Special specification: it is possible to measure 44Ca, 56Fe and 238U in Medium Resolution (R=4000) in ≤ 300 ms with RSD of the peak centroids ≤ 12 ppm for all 3 isotopes.)
3.	Possibility of scanning of oxide interferences (e.g. $^{238}UO/^{238}U$) during tuning of the instrument.	**YES** (Yes, software will display live ratio when monitoring mass of UO and U.)
4.	One more installed ion counter in the form of Faraday detector.	**YES** (The Element XR is equipped with a discrete dynode detector system using a fully automated on the fly cross calibration. The pulse and analogue counting provide 9 orders of magnitude dynamic range. The addition of the Faraday detector within the Element XR increases the linear dynamic range by a further 3 orders of magnitude for maximum flexibility. The combination of pulse analogue and faraday detector allows the measurement of major and trace elements within one analytical run saving time and reducing sample preparation times. >1012 linear dynamic range with automatic gain calibration.)
WARRANTY AND SUPPORT		
No.	**Parameter**	**Value**
1.	Free technical and ICP-MS software support through phone and/or e-mail consultations. *(/ B= at least for 5 years from Equipment handover)*	**B** at least for 5 years from Equipment handover
2.	Technical and service support through a trained technician, who will speak Czech. *(YES / NO)*	**Yes**

Annex 2

Cenová nabídka KV.N 27-009

Cena přístroje včetně příslušenství, instalace a zaškolení

11.200.000,- Kč

Pragolab s.r.o.
Nad Krocínkou 55, 190 00 Praha 9
IČO: 48029289
DIČ: CZ48029289
Firma zapsána u Městského soudu
V Praze, oddíl C, vložka 14590

Bankovní spojení:
ČSOB Praha, kód b. 0300
č. účtu 700076823
Telefon: +420 284 813 020
Internet: www.pragolab.cz
E-mail: pragolab@pragolab.cz

Nabídka KV.N 24-009

Číslo dokladu: KV.N 24-009
Referent: [redacted]

Datum: 17.5.2024
Datum platnosti: 28.6.2024

Dodavatel:

Pragolab s.r.o.

Nad Krocínkou 55/285
190 00 Praha 9

IČ: 48029289, DIČ: CZ48029289
Firma zapsána u Měst. soudu v Praze
oddíl C, vložka 14590
tel: +420 284 813 020
e-mail: pragolab@pragolab.cz
Internet: www.pragolab.cz

Odběratel:

Geologický ústav AV ČR, v.v.i.

[redacted]
Rozvojová 269
165 00 Praha 6 - Lysolaje

IČ: 67985831, DIČ: CZ67985831
tel: 233087253

Platební údaje:

Způsob úhrady: Bankovním převodem
Požadovaná záloha: 0,00 Kč
Úrok: 0,05
Splatnost dní: 60
Měna: CZK

Obchodní údaje:

Doprava:

Popis	*Číslo*	*Množství*	*Cena za jedn.*	*Cena bez DPH*	*DPH*	*Cena celkem*
"ELEMENT XR mass spectrometer with extended dynamic range	0724729	1 Ks	[redacted]			
Jet Interface Kit 2 for Element 2/XR	BRE00212	1 Ks				
Water chiller TF25 B A 230/50 T1 IPR 35micron SPCLFTG (air-water)	12116301	1 Ks				
PFA Microconcentric nebulizer for organic matrix inlet system (50 µL/min)	1135450	2 Ks				
PFA Microconcentric nebulizer for organic matrix inlet system (20 µL/min)	1083921	2 Ks				
"PFA Microconcentric nebulizer for acid-resistant inlet system and standard inlet system (100 µL/min)"	1083911	1 Ks				
Stable introduction system for high precision measurements (isotope ratios)	1127121	1 Ks				
ESI Autosampler SC-2 DX without FAST	1238590	1 Ks				
Jet Sample cone, nickel	1260630	3 Ks				
Skimmer cone, nickel	1067600	3 Ks				
Sample cone, platinum	1067501	1 Ks				
Skimmer cone, platinum	1047461	1 Ks				
Torch ELEMENT	1091250	2 Ks				
Quartz injector for standard torch (2.2 mm i.d.)	1161910	2 Ks				
Sapphire injector for standard torch	1091260	1 Ks				
Discount		1 Ks				
Celkem:		**24 mj**		**11 200 000,00**	**2 352 000,57**	**13 552 000,57**

Zaokrouhlení: 0,00 Kč
Celkem: **13 552 000,57 Kč**

Vystavil:

Převzal doklad/zboží:

thermoscientific

PRODUCT SPECIFICATIONS

Element 2/Element XR High Resolution ICP-MS

Clean up your spectra–make your analysis easy

Benefits

- Flexibility with simple method development
- Physical elimination of interferences
- Routine use of high mass resolution
- High sensitivity for solutions and Laser Ablation
- High precision isotope ratios

Keywords

Element HR-ICP-MS, ICP-MS, Specifications, High mass resolution

The Thermo Scientific™ Element 2™ and Element XR™ High Resolution ICP-MS provide class-leading elimination of interferences for the highest level of confidence. With ultra-sensitive and reliable multi-element analyses at trace-level concentrations there is no need for complicated sample preparation and method development.

Spectral interferences are the main limitation of ICP-MS. High resolution with a sector-field mass spectrometer distinguishes the analyte from most interferences by exploiting small differences in mass-to-charge. This ability can be used for elemental quantification and isotope ratio analysis for nearly the whole periodic table, and in almost all matrices. High resolution results in simple clear spectra and does not create additional interferences.

The high sensitivity of the Element Series (with optional Jet Interface for enhanced sensitivity) allows high precision isotope ratio measurements.

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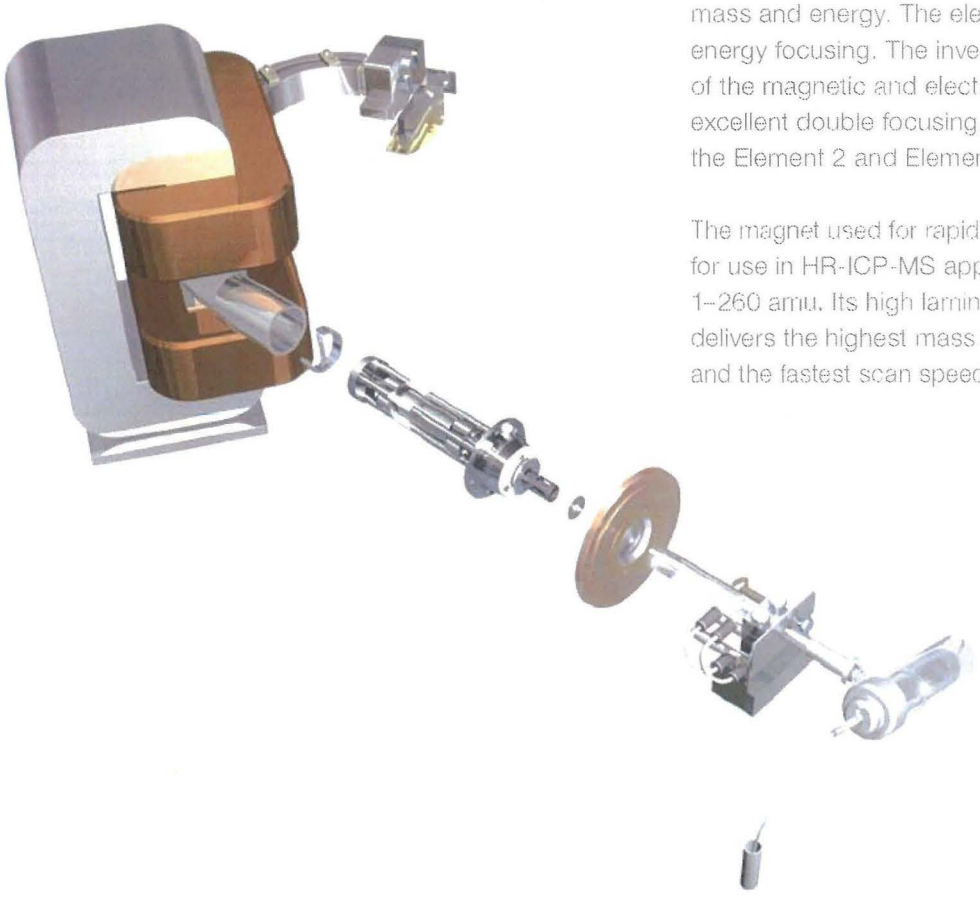
Features

- High mass resolution: Accurately measure isotope signals separate from spectral interferences and produce clean elemental spectra while retaining flexibility.
- Straightforward analytical methods: Providing visual confirmation of accurate measurements.
- Interference removal: no use of reactive gases.
- High sensitivity: Get accurate and precise multi-element analysis down to pg·L^{-1} concentrations for all resolutions. The Element XR HR-ICP-MS increases the linear dynamic range by an additional three orders of magnitude for maximum flexibility.
- Ideal for transient multi-elemental signals, such as laser ablation, HPLC, GC, CE, FFF.
- High-precision isotope ratios.
- An advanced research tool with the reliability and robustness to serve in 24/7 production control.
- Optional Jet Interface for enhanced sensitivity. This option consists of a high capacity dry interface pump and a specially designed set of cones.



Double focusing magnetic sector field ICP-MS

Plasma and interface

The ion source and interface of the Element 2 and Element XR High Resolution ICP-MS are at ground potential to enable a straightforward coupling of Laser Ablation and chromatography techniques like HPLC, CE, GC. The interface and the ion transfer optics focusing the ion beam onto the high resolution slit are designed for optimized sensitivities at all resolutions. This results in very low background, highest sensitivity and minimum mass bias at maximum stability. Hot and Cold plasma modes can be used routinely from the same sample vial for semiconductor applications.

High mass resolution

The Element 2 and Element XR HR-ICP-MS fully automatically change between three fixed resolutions by switching the positions of the entrance and exit slits in < 1 s. The design of the fixed slit mechanism offers maximum stability and reproducibility of resolutions. Even in high resolution mode, the intrinsic sensitivity of the Element 2 and XR HR-ICP-MS instruments provides sub ppt detection limits.

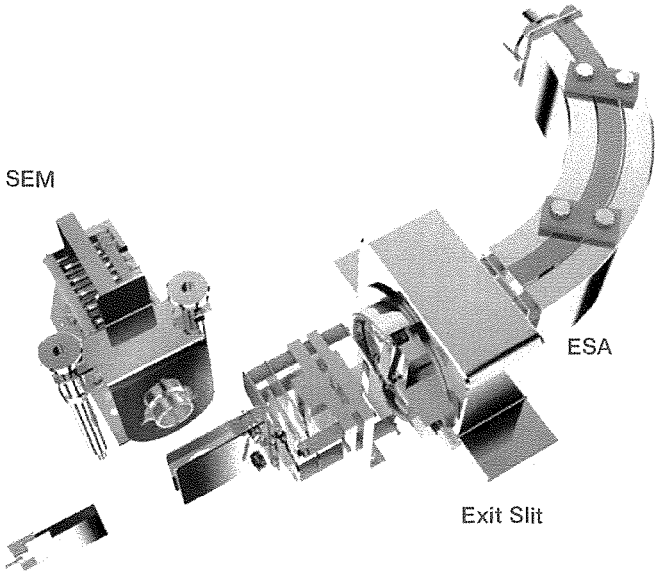
Mass separation

The magnetic field disperses ions according to their mass and energy. The electrostatic analyzer provides energy focusing. The inverse Nier-Johnson geometry of the magnetic and electrostatic fields results in the excellent double focusing, high resolution properties of the Element 2 and Element XR HR-ICP-MS.

The magnet used for rapid scanning is specifically designed for use in HR-ICP-MS applications in the mass range 1–260 amu. Its high lamination and efficient water-cooling delivers the highest mass stability (better 25 ppm/8 hours) and the fastest scan speed for a wide range of applications.

Detection system

The Element 2 HR-ICP-MS is equipped with a discrete dynode detector system using a fully automated, on the fly cross calibration. The pulse counting and the analog mode provide 9 orders of magnitude dynamic range. The Element XR HR-ICP-MS increases the linear dynamic range by a further 3 orders of magnitude for maximum flexibility, by using an additional Faraday mode and at improved abundance sensitivity by the filter lens.



Software

Maximum level of transparency

The software package is optimized for the needs of the routine analyst, providing ease of use for day-to-day operation as well as flexibility for advanced research. The Thermo Scientific™ Element™ Software Suite controls and monitors all instrument functions for ICP-MS analysis and provides all necessary features for data evaluation. While Sequence Editor as the main data browser allows maximum flexibility, it still maintains the ease of use of a high-resolution instrument. The main functions can be customized to allow routine 24/7 operations, such as imports of sample lists and autosampler positions into Sequence editor, as well as triggering, customized data exporting and flexible LIMS connectivity.

Mass separation

The magnetic field disperses ions according to their mass and energy. The specially designed magnet and magnetic field regulator used in the Element 2 and Element XR HR-ICP-MS offer extremely high mass stability and ultra-fast scan speed.

Both HR-ICP-MS are able to automatically switch between three fixed resolutions in less than a second. The design of the switching mechanism offers superior stability and reproducibility of resolutions, proven in hundreds of labs worldwide.

Low resolution, *analysis of non-interfered isotopes with the highest sensitivity and isotope ratio precision.*

Medium resolution, *guarantees interference-free analysis for most elements in the majority of matrix types.*

High resolution *is deployed for unequivocal separation of analytes and interferences in the most challenging matrices.*

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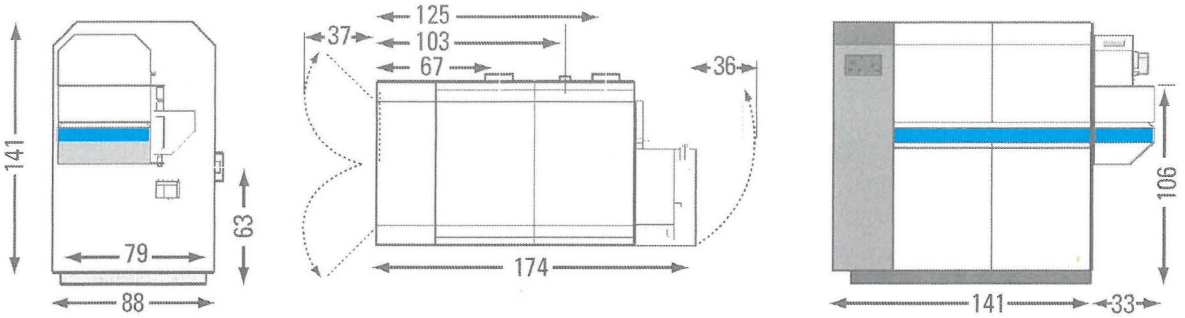

Footprint and dimensions in cm

Specification

	Sensitivity (concentric nebulizer)	> 1 x 10^9 counts per second (cps)/ppm In
	Sensitivity (optional Jet Interface)	> 3 x 10^9 counts per second (cps)/ppm In
	Sensitivity (optional Jet Interface with desolvation)	> 20 x 10^9 counts per second (cps)/ppm In
4	Mass stability	< 25 ppm drift in 8 hours operation
	Dark noise	< 0.2 cps (Skimmer valve closed)
	Detection power	< 1 ppq for non-interfered nuclides (3 SD of dark noise / sensitivity of In)
	Dynamic range	> 10^9 linear with automatic gain calibration (Element 2) > 10^{12} linear with automatic gain calibration (Element XR)
3	Mass resolution	300, 4000, 10,000 (10% valley, equivalent to 5% height)
5	Signal stability	< 1% RSD over 10 minutes < 2% RSD over 1 hour
6	Scan speed (magnetic)	*m/z* 7 to 238 to 7 < 150 ms
	Scan speed (electric)	1 ms/jump, independent of mass range
8	Oxide and doubly charged ions	ratio / measured BaO^+/Ba^+ < 0.002 Ba^{2+}/Ba^+ < 0.03

Site requirements

Power	3-phase, 230/400 V ±10%, 50/60 Hz fused 32 A per phase
Environment	Temperature 18–24 °C (64–75 °F), humidity 50–60%, non-condensing, non-corrosive, temperature stability better than 2 °C/h (< 3.6 °F/h)
Cooling water	~ 200 l/h, temperature 10–20 °C 4–6 bar (43–65 psi)
Argon	Purity 99.996 min, 18 L/min Regulated pressure 8–10 bar (116–145 psi) Uninterrupted argon supply recommended
Plasma exhaust	1 x 6 cm Ø; 90 m^3/h (Argon + suspended sample)
Electronics exhaust	2 x 15 cm Ø; 800 m^3/h
Vibration	< 10 µm movement peak to peak for > 30 Hz
Heat of instrument	3 kW in operation
Magnetic fields	< 5 µT for any AC field

Find out more at **thermofisher.com/HR-ICP-MS**

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APPLICATION NOTE 30824

Long term multi-element signal stability in wet plasma

Authors: L. Bracciali, T. Lindemann, H. Vollstaedt, J. Roberts,
Thermo Fisher Scientific, Bremen, Germany

Keywords: HR-ICP-MS, Element XR, Jet Interface, multi-element signal stability

Introduction

A Single Collector ICP-MS instrument measures signal intensities while rapidly repeating mass scans from low to high mass. Signal intensities are measured sequentially at each mass of interest across the scan. Signal stability is therefore critical to ensure accurate and precise results in trace elemental and isotope ratio analysis by Single Collector ICP-MS.

Assuming homogeneity of the sample, signal stability largely relies on the overall performance of the mass spectrometer. For low concentration analytes, good signal stability will result in good detection limits. On the other hand, signal fluctuations (e.g. at the scale of the analytical session) would bias the results by introducing artificial inter-sample variations.

Signal stability can be expressed as Relative Standard Deviation (RSD) of a signal intensity measured over a period of time. It is generally observed that short term stability (e.g. monitored over a period of a few minutes) is better than signal stability monitored over a longer period of time (e.g. tens of minutes or hours).

Here we report signal stability data for a 1 ppb multi-element solution. The data were collected in wet plasma conditions with a Thermo Scientific™ Element XR™ HR-ICP-MS equipped with an optional High Capacity Air-cooled Dry Interface Pump (100 m³/h pumping speed), replacing in these experiments the standard interface pump of the mass spectrometer.

In a first set of experiments, the HR-ICP-MS was equipped with standard cones (Standard sample cone and H skimmer cone) while in a second set of experiments the Jet sample cone and X skimmer cone were used.

This latter configuration (High Capacity Air-cooled Dry Interface Pump, Jet sample cone and X skimmer cone) corresponds to the optional Jet Interface available for the Element Series HR-ICP-MS. The Jet Interface enables the Element HR-ICP-MS to set a new standard for sensitivity in elemental analysis (Thermo Scientific Application Note 30685).

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In all experiments, twenty-six isotopes in total were measured in low to high mass resolution mode and the signal stability was monitored for several hours during each experiment. The signal stability was consistent across each experiment. In this Application Note we report data from a representative 2 hour interval from each of the two sets of experiments.

Remarkably, the RSD over 2 hours was ~ 1.5% for all isotopes in both sets of experiments. For reference, the specified signal stability of the Element Series HR-ICP-MS is ~ 1% RSD over 10 minutes and < 2% RSD over 1 hour (Thermo Scientific Product Specification PS30436).

Additionally, when the Jet sample cone and X skimmer cone were used, a general improvement of the long term (2 hour) signal stability was observed in the low mass range and in all resolution modes, with most isotopes yielding RSDs ~ 1%.

Analytical setup and methods

Table 1 details the operating conditions of the Element XR HR-ICP-MS for both sets of experiments. The sample flow was determined gravimetrically and the detection sensitivity reported here was determined on the same multi-element solution used for the experiments. Plasma conditions were tuned to minimize oxide formation. Each replicate sample was measured for 4.3 minutes, with a take-up time of 2 minutes.

Table 1. Operating conditions and acquisition parameters

	First experiment (Standard and H cones)	Second experiment (Jet and X cones)
Sample introduction	Twinnabar™-type quartz cyclonic spray chamber; 200 µL/min MicroMist™ nebulizer, self-aspirating; 2.2 mm I.D. quartz injector tube	
Cones	Standard Ni sample cone and Ni H skimmer cone	Ni Jet sample cone and Ni X skimmer cone
RF power	1250 W	1100 W
Sample gas flow	0.9 l/min	1.1 l/min
Detection mode	Triple	
Sample type	1 ppb multi-element solution from dilution of SPEX CertiPrep™ Multi-element Solutions 2 and 4 in 3% HNO_3	
Sample flow	220 µL/min	190 µL/min
Isotopes monitored	10, 15 and 1 isotopes were respectively measured in LR, MR and HR. Full list and resolution modes in Fig. 3.	
Detection sensitivity in Low Resolution (> 300)	1.3 *10^6 cps/ppb ^{115}In	5.5 *10^6 cps/ppb ^{115}In
Detection sensitivity in Medium Resolution (R > 4000)	4.4 *10^4 cps/ppb ^{56}Fe	3.1 *10^5 cps/ppb ^{56}Fe
Detection sensitivity in High Resolution (R > 10000)	1.5 *10^4 cps/ppb ^{39}K	9.2 *10^4 cps/ppb ^{39}K

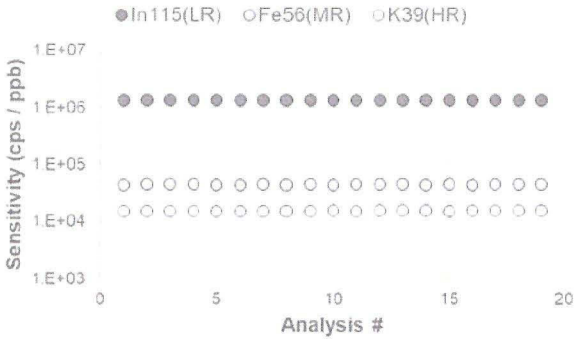

Fig. 1. Sensitivity data for three isotopes measured in different resolution modes with Standard sample cone and H skimmer cone. Total measurement time was 2 hours corresponding to 19 individual analysis. Note the logarithmic scale for the y-axis.

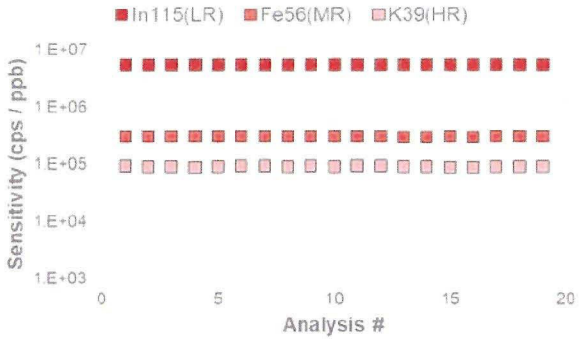

Fig. 2. Sensitivity data for the same isotopes as in Fig. 1 measured with Jet sample cone and X skimmer cone. Total measurement time was 2 hours corresponding to 19 individual analysis. Note the logarithmic scale for the y-axis.

Results: Sensitivity

Two-hour sensitivity data are plotted in Fig. 1 and Fig. 2 for three isotopes, one for each of the mass resolution modes: ^{115}In (LR), ^{56}Fe (MR) and ^{39}K (HR). The increase in sensitivity with the full Jet Interface option (Fig. 2) is remarkable: the sensitivity of ^{115}In measured in LR mode shows a ~4-fold increase, while for ^{56}Fe (MR) and ^{39}K (HR) the sensitivity is respectively ~7 and ~6 times higher in comparison to standard cones (Table 1).

Two-hour average sensitivity for all the twenty-six monitored isotopes is plotted in Fig. 3. Consistent with what was previously reported (Thermo Scientific Application Note 30685), we observed that the increase in sensitivity was more pronounced for the lighter masses relative to the higher end of the mass range (Fig. 3, left panel).

Results: Stability

Two-hour RSD data for all monitored isotopes are plotted in Fig. 4.

In low resolution mode all isotopes monitored during both experiments yielded RSDs < 1.5%, with the majority between 0.4 and 1.0% (Fig. 4, left panel). No significant difference is observed between both analytical set-ups, except a lower stability for Li measured with Standard sample cone and H skimmer cone.

In medium resolution mode all isotopes measured during the first experiment with Standard sample cone and H skimmer cone yielded RSDs between 0.7 and 1.4% (Fig. 4, right panel). For 9 out of 15 isotopes measured in MR we report RSDs < 1.0%.

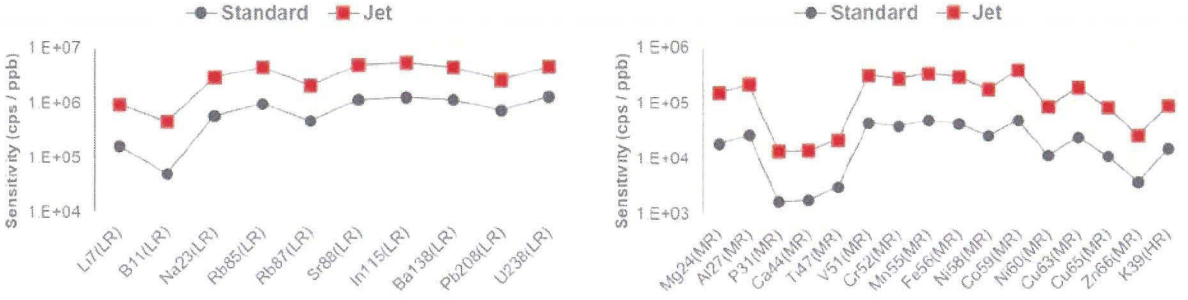

Fig. 3. Average of two-hour sensitivity data for a multi-element 1 ppb solution. Left panel: isotopes measured in LR mode. Right panel: isotopes measured in MR and HR mode. Each datapoint is the average of nineteen measurements.

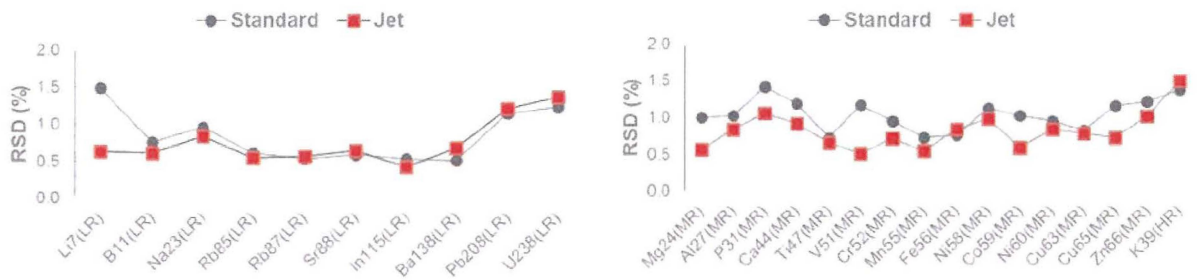

Fig. 4. Two-hour stability data (RSD % determined on the same 19 measurements as in Fig. 3). Left panel: isotopes measured in LR mode. Right panel: isotopes measured in MR and HR mode.

Remarkably, all the isotopes measured in MR (^{24}Mg to ^{66}Zn) with Jet sample cone and X skimmer cone yielded similar or lower RSD values, compared to the first experiment, ranging between 0.5 and 1.1%.

In high mass resolution mode ^{39}K yielded similar RSDs of 1.4 and 1.5% in both experiments.

The long-term stability of the measurements is also apparent from Fig. 5 where the blank-subtracted intensities of all isotopes are plotted for the 2 hour interval (19 measurements in total).

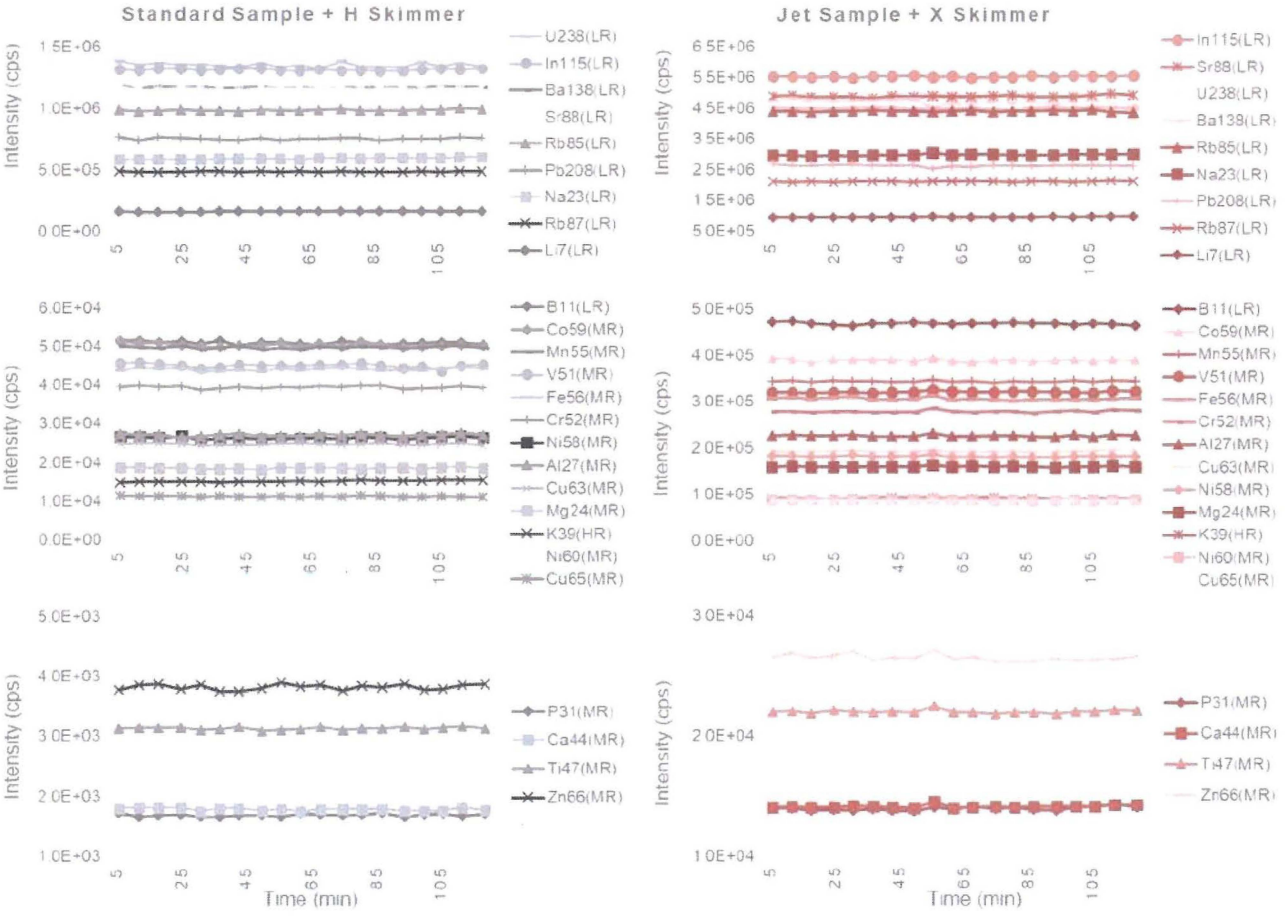

Fig. 5. Two-hour intensity data for all isotopes monitored in the 1 ppb multi-element solution. Left panel: with Standard sample cone and H skimmer cone. Right panel: with Jet sample cone and X skimmer cone. Same data as in Figures 3 and 4.

Annex.3

Affidavit

Public Contract name:	**HR ICP-MS with Excimer laser**

Bidder / Supplier

Registered company name / Trade name / Name:	Pragolab s.r.o
Registered Office:	Nad Krocínkou 285/55, 190 00 Praha 9, Czech Republic
(Company) Identification No.:	48029289

The Supplier of the above-mentioned Public Contract undertakes to:

a) ensure compliance with all labour law regulations (concerning remuneration, working hours, rest periods between shifts, paid overtime), as well as regulations concerning employment and safety and health protection for the entire duration of the contractual relationship established on the basis of this Public Contract, to all persons involved in the performance of the contract (regardless of whether the activities will be performed by the Supplier himself or his subcontractors) and

b) ensure compliance with legal regulations in the field of environmental law, which meets the objectives of environmental policy related to climate change, use of resources and sustainable consumption and production. The Supplier must therefore take all measures that can reasonably be required of him to protect the environment and reduce the damage caused by pollution, noise and other activities, and must ensure that emissions, soil pollution and waste water from his activities do not exceed the values laid down in the relevant legislation.

At the same time, the Supplier acknowledges that a breach of the above obligations may be a reason for the Contracting Authority to withdraw from the contract in accordance with its relevant provisions.

Signature of the person authorized to represent the Bidder/Supplier:	
Place:	Prague
First name, Surname, Position in the company:	Bc. Ladislav Náměstek, Managing Director (jednatel společnosti)
Signature:	