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European Structural and Investing Funds  
Operational Programme Research,  
Development and Education



*Buyer's Contract No. S22/065H*

## **PURCHASE CONTRACT**

This purchase contract ("**Contract**") was concluded pursuant to section 2079 *et seq.* of the act no. 89/2012 Coll., Civil Code, as amended ("**Civil Code**"), on the day, month and year stated below by and between:

- (1) **Institute of Physics of the Academy of Sciences of the Czech Republic, a public research institution,**

with its registered office at: Na Slovance 2, Praha 8, 182 21, Czech Republic

registration no.: 68378271

represented by: RNDr. Michael Prouza, Ph.D. – director

(„**Buyer**"); and

- (2) **OptiXs, s.r.o.**

with its registered office at: Křivoklátská 37, 199 00 Praha 9

registration no.: 02016770

represented by: Ing. Aleš Jandík, CEO

enrolled in the commercial registered kept by Municipal Court in Prague C 212 818

(„**Seller**").

(The Buyer and the Seller are hereinafter jointly referred to as „**Parties**" and individually as "**Party**".)

### **WHEREAS**

- (A) The Buyer is a public contracting authority and the beneficiary of a grant of the Ministry of Education, Youth and Sports of the Czech Republic within the Operational Programme Research, Development and Education. The Buyer carries out a project financed by the grant specified herein in this provision („**Project**").
- (B) For the successful realization of the Project it is necessary to purchase the Object of Purchase (as defined below) in accordance with the Rules for the Selection of Suppliers within the Operational Programme Research, Development and Education.



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- (C) The Seller wishes to provide the Object of Purchase to the Buyer for consideration.
- (D) The Seller's bid for the public procurement entitled „*Spectrofluorometer*”, whose purpose was to procure the object of purchase („**Public Procurement**”), was selected by the Buyer as the most suitable.
- (E) The Seller acknowledges that the Buyer is not, in connection to the subject matter of this Contract, an entrepreneur, and also that the subject matter of this Contract is not related to any business activities of the Buyer.
- (F) The documentation necessary for the execution of the Contract is
  - Technical Specification, which forms an integral part hereof as its Annex No. 1 to this Contract (hereinafter the “**TS**”); this TS also formed a part of the tender documentation for the Public Procurement in the form of Annex No.2,

## **IT WAS AGREED AS FOLLOWS:**

### **1. BASIC PROVISIONS**

- 1.1 Under this Contract the Seller shall deliver to the Buyer an upgradable system for excitation and emission photoluminescence measurements of solid-state and liquids sample (Spectrofluorometer) as described in detail in Annex 1 (Technical Specification) to this Contract in the required quality, and with the properties and related performance described therein („**Object of Purchase**”) and shall transfer to the Buyer ownership right to the Object of Purchase, and the Buyer shall take over the Object of Purchase and shall pay the Seller the Purchase Price (as defined below), all under the terms and conditions stipulated in this Contract.
- 1.2 Under this Contract the Seller shall also carry out the following activities („**Related Activities**”):
  - a) Transport and delivery the Object of Purchase to the place of delivery (Art. 2.2 of the Contract);
  - b) Setup and installation of the Object of Purchase including Site Acceptance Test (SAT) to be carried out at the end of installation at the place of delivery at the place of delivery (Art. 2.2 hereof);
  - c) Provide the Buyer with training in English language carried out for approximately three Buyer's employees, and which shall start on the last day of the Object of Purchase installation and shall take up to two (2) working days in length, unless Buyer and Seller agree otherwise;



- d) Provide the Buyer with a certificate of conformity for CE marking;
- e) Provide the Buyer with the Operating and Maintenance manuals, in English in reproducible form; and
- f) Cooperate with the Buyer anytime during the performance of this Contract.

## 2. THE TIME AND PLACE OF DELIVERY

- 2.1 The Seller shall deliver the whole Object of Purchase and shall carry out Related Activities stated in Art. 1.2 a) within **9 months** from the effectiveness of this Contract, unless stipulated otherwise in this Contract. The Buyer is entitled to prolong the time for delivery Object of Purchase and for carrying out Related Activities for four (4) more weeks, should there be important reasons for that on the side of the Buyer, such as, but not only, impossibility to take over the Object of Purchase at the premises agreed in this Contract (place of delivery in Art. 2.2 of this Contract) due to reconstruction works taking place there.
- 2.2 The place of delivery shall be Fyzikální ústav AV ČR, v.v.i - HiLASE Centrum, Za Radnicí 828, 252 41 Dolní Břežany, Czech Republic or any other address in Dolní Břežany, Czech Republic, which the Buyer communicated to the Seller prior to the delivery of the Object of Purchase (“**Place of delivery**”).
- 2.3 The Seller acknowledges that the deadlines stated in this Article are of essential importance to the Buyer with respect to the timeline of the Project with respect to the deadline by which the Project are to be implemented, and that the Buyer could incur damage as a result of failure to meet the above stipulated deadlines.

## 3. THE OWNERSHIP RIGHT

The ownership right to the Object of Purchase shall be transferred to the Buyer upon the signature of the Handover Protocol.

## 4. PRICE AND PAYMENT TERMS

- 4.1 The purchase price for the Object of Purchase is **61 832 EUR** („**Purchase Price**”) **excluding VAT**. VAT shall be set and paid in accordance with respective legislation.
- 4.2 The Purchase Price cannot be exceeded and includes all costs and expenses of the Seller related to the performance of this Contract. The Purchase Price includes, among others, all expenses related to the delivery, the handover of the Object of Purchase and execution of Related Activities, costs of copyright, insurance,



customs, warranty service and any other costs and expenses connected with the performance of this Contract.

- 4.3 The Purchase Price for the Object of Purchase shall be paid on the basis of a tax document – invoice, to the account of the Seller designated in the invoice.
- 4.4 The Buyer shall realize payments on the basis of duly issued invoice within thirty (30) calendar days from their receipt. If the Seller stipulates any shorter due period of an invoiced amount in an invoice, such different due period shall not be deemed relevant and the due period stipulated herein prevails. The Purchase Price shall be issued and paid only after the Handover Protocol signature.
- 4.5 The invoice issued by the Seller as a tax document must contain all information required by the applicable laws of the Czech Republic. Invoice issued by the Seller in accordance with this Contract shall contain in particular following information:
- a) Name and registered office of the Buyer,
  - b) Tax identification number of the Buyer,
  - c) Name and registered office of the Seller,
  - d) Tax identification number of the Seller,
  - e) Registration number of the tax document,
  - f) Scope of the performance under this Contract (including the reference to this Contract),
  - g) Date of the issue of the tax document,
  - h) Date of the fulfillment of the Contract,
  - i) Purchase Price,
  - j) Registration number of this Contract, which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice,
  - k) Declaration that the performance of the Contract is for the purposes of the Project; the exact details of the Project including name and reg. number will be communicated to the Seller based on Seller's request, which shall be sent to the Buyer to following e-mails: xxxxx and xxxxx before an invoice is issued.

and must also comply with any double taxation treaties applicable to the given case.



- 4.6 Seller shall issue an electronic invoice and send it to following e-mails: xxxxx and xxxxx for preliminary check. After the preliminary check the Seller shall send the final electronic invoice to xxxxx
- 4.7 The last invoice in each calendar year must be delivered by the Seller to the Buyer's no later than by December 15 of the given calendar year. In case that the invoice shall not contain the above mentioned information or the invoice does not comply with the requirements stipulated by law or the invoice is delivered to the Buyer later than by December 15 of the given calendar year, the Buyer is entitled to return it to the Seller during its maturity period and this shall not be considered as a default. The new maturity period shall begin from the receipt of the supplemented or corrected invoice to the Buyer.
- 4.8 The Buyer's invoicing details are set out in provision (1) hereof.

## 5. **SELLER'S RIGHTS AND DUTIES**

- 5.1 The Seller shall ensure that the Object of Purchase and Related Activities are in compliance with this Contract including all its annexes and applicable legal (e.g. safety), technical and quality norms.
- 5.2 During the performance of this Contract, the Seller proceeds independently. If the Seller receives instructions from the Buyer, the Seller shall follow such instructions unless these are against the law or in contradiction to this Contract. If the Seller, while exercising due professional care, finds out or should have found out that the instructions are for any reason inappropriate or illegal or in contradiction to this Contract, then the Seller must notify the Buyer.
- 5.3 All things necessary for the performance of this Contract shall be procured by the Seller, unless this Contract stipulates otherwise.

## 6. **HANDOVER OF THE OBJECT OF PURCHASE**

- 6.1 Handover and takeover of the Object of Purchase shall be realized on the basis of handover protocol ("**Handover Protocol**") which shall be signed only after the Object of Purchase delivery and take-over is over and which shall contain following information:
- identification of the Seller, the Buyer and all subcontractors, if there are any,
  - description of the Object of Purchase,



- the list of defects and deficiencies of the Object of Purchase, if there are any, and the deadlines for their removal,
  - the signature of the Seller and the Buyer and the date of the hand-over.
- 6.2 Instructions and manuals related to all items of the Object of Purchase shall be attached to the Handover Protocol at the latest.
- 6.3 If the Seller fails to duly carry out all Related Activities or if the Object of Purchase does not fully meet requirements of this Contract, the Buyer is entitled to refuse the takeover of the Object of Purchase. In such a case, the Seller shall remedy the deficiencies within thirty (30) calendar days, unless Parties agree otherwise. The Buyer is entitled (but not obliged) take over the Object of Purchase despite the above mentioned deficiencies, in particular if such deficiencies do not prevent the Buyer in the proper operation of the Object of Purchase. In such a case, the Seller and the Buyer shall list the deficiencies in the Handover Protocol, including the manner and the date of their removal (remedy). If the Parties do not reach agreement in the Handover Protocol regarding the date of the removal, the Seller shall remove the deficiencies within thirty (30) calendar days.
- 6.4 Parties hereby exclude application of section 2126 of the Civil Code.

## 7. WARRANTY

- 7.1 The Seller hereby provides a warranty of quality of the Object of Purchase for the period of 12 calendar months.
- 7.2 The warranty period shall commence on the day of the signature of the Hand-over protocol by both Parties. However, if the Object of Purchase is taken over with defects or deficiencies or the Seller fails to carry out any Related Activity stipulated in Art. 1.2 hereof, the warranty period shall commence on the date of the removal of the last defect or deficiency by the Seller.
- 7.3 The Seller shall remove defects that occur during the warranty period free of charge.
- 7.4 If the Buyer ascertains a defect of the Object of Purchase during the warranty period, the Buyer shall notify such defect without undue delay to the Seller (“**Warranty Claim**”). Defects may be notified on the last day of warranty period, at the latest; an email is considered an adequate way to initiate a Warranty Claim. Warranty Claim sent by the Buyer on the last day of the warranty period shall be deemed to be made in time.
- 7.5 The Buyer notifies defects in writing via e-mail. The Seller shall accept notifications of defects on the following e-mail address: xxxxx



- 7.6 In the Warranty Claim the Buyer shall describe the defect and the manner of removal of the defect. The Parties shall agree on the manner of defect's removal. If the Parties do not reach the agreement, the Buyer has the right to:
- a) request removal of the defect by the delivery of Object of Purchase or its individual parts, or
  - b) request removal of the defect by repair, or
  - c) request adequate discount from the Purchase Price.

The choice among the above mentioned rights shall be made by the Buyer, who shall take into account reasonable balance between economic perspective of the Seller and Buyer's work planning on the Project. However, in case of a removable defect that occurs for the first time the Buyer shall not request removal of the defect by delivery of new Object of Purchase or its individual parts.

- 7.7 The Seller shall remove the defect within thirty (30) calendar days from the date on which the Warranty Claim was notified to the Seller, at the latest, unless the Buyer and the Seller agree otherwise.
- 7.8 The Seller shall remove defects of the Object of Purchase within periods stated in the Contract also in the instances when the Seller is of the opinion that he is not liable for such defects. In cases when the Seller will not recognize the defect and the Buyer will not agree with such conclusion, the validity of the Warranty Claim shall be ascertained by an expert, which is to be commissioned by the Buyer but with whom the Supplier also must agree. In the event the expert declares the Warranty Claim as justified, the Seller shall bear the costs of the expert's assessment. If the Warranty Claim is raised unjustly according to expert's assessment, the Buyer shall reimburse the Seller all reasonably incurred costs associated with removing the defect.
- 7.9 Parties shall execute a protocol on the removal of the defect, which shall contain the description of the defect and the confirmation that the defect was removed. The warranty period shall be extended by the time that expires from the date of exercising the Warranty Claim until the defect is removed in cases where the Buyer was prevented from using the Object of Purchase for its intended purpose.
- 7.10 In case that the Seller fails to remove the defect within time stipulated in this Contract or if the Seller refuses to remove the defect, then the Buyer is entitled to remove the defect at his own costs and the Seller shall reimburse these costs within thirty (30) calendar days after the Buyer's request to do so.



- 7.11 The warranty does not cover defects caused by unprofessional handling or by the failure to follow Seller's instructions for the operation and maintenance of the Object of Purchase.
- 7.12 Parties exclude application of the section 1925 (the sentence behind semi-colon) of the Civil Code.

## 8. **TERMINATION, RIGHT OF WITHDRAWAL, CONTRACTUAL PENALTIES**

- 8.1 This Contract may be terminated by completing the performance required hereunder, by agreement of the Parties or by withdrawal from the Contract on the grounds stipulated by law or in the Contract.
- 8.2 The Buyer is entitled to withdraw from this Contract, if any of the following circumstances occur:
- (a) the Seller has materially breached obligations imposed by the Contract, specifically by being in delay with the fulfillment of this Contract and such delay lasts more than 6 weeks; or
  - (b) the Seller has materially breached obligations imposed by the Contract, specifically Object of Purchase fails to meet technical parameters and qualities or other requirements defined in the Annex 1 (Technical Specification);
  - (c) the insolvency proceeding is initiated against the Seller's assets;
  - (d) the funding body providing finances for the Project ("**Financial subsidy**") or any other control body determines that the expenditures or part of the expenditures incurred on the basis of this Contract are ineligible;
  - (e) the Financial subsidy for implementation of the Project is withdrawn from the Buyer, however Buyer hereby declares that there is financial subsidy in place at the time of signing the Purchase Contract; or
  - (f) should it become apparent that the Seller provided information or documents in the Seller's bid, which were not true and which could, therefore, influence the outcome of the Procurement Procedure leading to the conclusion of this Contract.
- 8.3 The Seller is entitled to withdraw from the Contract in the event of material breach of the Contract by the Buyer and in case of events outside the control of the Seller (e.g. natural disasters, etc.).





- 8.4 In the event that the Seller is more than one (1) week in delay with term of delivery as stipulated in Art. 2.1. hereof, the Seller shall pay to the Buyer the contractual penalty in the amount of 30 EUR for each, even commenced day of delay, since the first day of the delay.
- 8.5 In the case where the Seller fails to remove defects within the periods stipulated in the Contract and the delay is more than one (1) week, the Seller shall pay to the Buyer a contractual penalty in the amount of 30 EUR for each defect and for each calendar day of delay, since the first day of the delay.
- 8.6 If the Buyer fails to pay the Purchase Price within the deadlines set out in this Contract, the Buyer shall pay the Seller interest on delay in the amount set forth by the law for each day of delay unless the Buyer proves that the delay with the payment of the Purchase Price was caused by late release of the Financial subsidy for the Project by the funding body.
- 8.7 The obliged party must pay any contractual penalties to the entitled party not later than within fifteen (15) calendar days of the date of receipt of the relevant claim from the other party.
- 8.8 Payment of the contractual penalties pursuant to this Article shall in no way prejudice the Buyer's right to claim compensation for damage incurred by the Buyer as a result of the Seller's breach of obligations to which the penalty applies. The Parties have agreed that the maximal amount of claim compensation for damage incurred by the Buyer as a result of the Seller's breach of obligations to which the penalty applies shall be limited to 100% of the Purchase Price.
- 8.9 The Parties have agreed that the maximal amount of contractual penalties shall be limited to 5% of the Purchase Price.
- 8.10 The Buyer is entitled to set off by unilateral declaration any of its receivable or part of its receivable resulting from contractual penalty against Seller's claim to pay Purchase price.

## 9. **SOCIAL, ECOLOGICAL AND INNOVATIVE ASPECTS**

The Buyer aims to conclude contracts with suppliers that take into account and implement the principles of social responsibility, ecological sustainability and innovation. Therefore, the Seller shall ensure that:

- a) this Contract shall be fulfilled only by persons that are employed in accordance with the applicable legal regulations (no illegal or child workers);



- b) while performing this Contract, all applicable health and safety regulations and rules at work place are observed;
- c) all persons performing this Contract are employed under fair and non-discriminatory working conditions;
- d) if presented with different manners of fulfilling this Contract, the Seller shall select the solution/process that is in accordance with the principles governing nature conservation and nature protection, ecological sustainability and ecological waste management; and
- e) if presented with different manners of fulfilling this Contract, the Seller shall select the solution/process that is the most innovative.

## 10. **SPECIAL PROVISIONS**

By signing this Contract, the Seller becomes a person that must cooperate during the finance control within the Act no. 320/2001 Coll., on finance control in the public administration, as amended, and shall provide to the Directing Body of the Operational Programme Research, Development and Education or other control bodies (such as, but not only, European Commission, European Court of Auditors) access to all parts of the bid, Contract or other documents that are related to the legal relationship formed by this Contract. This duty also covers documents that are subject to the protection in accordance with other acts (business secrets, secret information, etc.) provided that control bodies fulfill requirements stipulated by these acts. The Seller shall secure that all its subcontractors are also obliged to cooperate with control bodies in the above stipulated extent. The Seller shall secure that all its subcontractors are also obliged to cooperate with control bodies in the above stipulated extent. The Seller is obliged to duly archive all written material prepared in connection with the execution of this Contract and to provide access to the Buyer to these archived documents until 2030; any finance control may also be carried out until year 2030.

## 11. **FINAL PROVISIONS**

- 11.1 This Contract is governed by the laws of the Czech Republic, especially by the Civil Code.
- 11.2 All disputes arising out of this Contract or out of legal relations connected with this Contract shall be preferable settled by a mutual negotiation. In case that the dispute is not settled within sixty (60) calendar days, such dispute shall be decided by courts of the Czech Republic in the procedure initiated by one of the Parties.
- 11.3 All modifications and supplements of this Contract must be in writing.
- 11.4 In the event that any of the provisions of this contract shall later be shown or determined to be invalid, putative, ineffective or unenforceable, then such



invalidity, putativeness, ineffectiveness or unenforceability shall not cause invalidity, putativeness, ineffectiveness or unenforceability of the Contract as a whole. In such event the Parties undertake without undue delay to subsequently clarify any such provision using Sec 553(2) of the Civil Code, or to replace after mutual agreement such invalid, putative, ineffective or unenforceable provision of the Contract by a new provision, that in the extent permitted by the laws and regulations of the Czech Republic, relates as closely as possible to the intentions of the Parties to the Contract at the time of creation hereof.

- 11.5 The Parties agree that the Seller shall not be entitled to set off any part of its receivable, or receivable of its sub-debtor against the Buyer or any of his receivables, unless this Contract stipulates otherwise. The Seller shall not be entitled to assign any receivable arising in connection herewith to a third party. The Seller shall not be entitled to assign any rights or obligations arising to him hereunder or any of its parts to third parties.
- 11.6 The Parties declare that this Contract is concluded during the ongoing pandemic of COVID-19 disease. Most of the states including the Czech Republic take numerous actions and precautions to prevent spreading the pandemic, in particular, but without limitation, closing the borders, mandatory quarantine, temporary shutting down businesses etc. The disease itself may also affect the Parties and their operability, employees of the Parties, subcontractors etc. The Parties hereby agree that if the Buyer or Seller cannot fulfil any obligation under this Contract in connection with such precautions or actions of any state or with any other circumstance related to the disease and affecting the operability of the Party and such inability cannot be avoided despite of the prudence, foresight or reasonable effort of the Party affected by such precaution, action or circumstance, the affected Party shall without any undue delay notify the second Party about such case. Should be the notification and the reasons stated in the notification accepted by the second Party, the affected Party shall then not be in delay with performing its obligations under or resulting from this Contract and the Parties undertake to renegotiate the acceptable and not disproportionate time for delivery of the Object of Purchase or performance of any Related Activities and other obligations under or resulting from this Contract. The Parties may as well renegotiate the conditions or manners of performing Related Activities and other obligations under or resulting from this Contract within the limits of the Act. The Parties declare that they shall maintain confidentiality with respect to all facts and information they learned in connection with the Contract or during the performance of the Contract, and the disclosure of such facts or information could cause damage to the other Party. This confidentiality provision does not affect duties of Parties with respect to applicable legislation.



11.7 This Contract shall constitute complete agreement of the Parties on the Contract subject matter including the Object of Purchase and shall substitute any and all possible previous discussions, negotiations and agreements of the Parties related to the Contract subject matter including the Object of Purchase.

11.8 This Contract is executed in four (4) counterparts and each Party shall receive two (2) counterparts.

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

- **Annex No. 1:** Technical Specification of the Buyer (if Annex 1 uses the term “Contracting Authority” or “contracting authority” it means Buyer. If Annex 1 uses the term “Supplier” or “supplier”, it means Seller);
- **Annex No. 2:** Technical Specification of the Seller;

In case of any discrepancies between this Contract and any of its annexes, the provisions of this Contract shall prevail.

11.10 The Parties agree to publish the full text of this Contract, including its annexes, in the Register of Contracts pursuant to Act No. 340/2015 Coll., on Special Conditions for the Effectiveness of Certain Contracts, the Disclosure of These Contracts and the Register of Contracts, as amended (Act on the Register of Contracts).

11.11 This Contract shall become valid on the date of the signature of both Parties. The Contract shall become effective on the date of its publication at Register of Contracts.

## 12. **Representatives of the Parties**

12.1 The Seller has appointed the following authorised representatives for communication with the Buyer in relation to the subject of performance hereunder:

In technical matters: RNDr. Miroslav Kořínek Ph.D.

12.2 The Buyer has appointed the following authorised representatives for communication with the Seller in relation to the subject of performance hereunder:

In technical matters: Yury Ryabchikov: xxxxx ; Miroslava Flimelova: xxxxx

**IN WITNESS WHEREOF** attach Parties their signatures:



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## Buyer

Signature: \_\_\_\_\_  
Name: RNDr. Michael Prouza, Ph.D.  
Position: director  
Date:

## Seller

Signature: \_\_\_\_\_  
Name: Ing. Aleš Jandík  
Position: CEO  
Date:



## ANNEX 1

### TECHNICAL SPECIFICATION OF THE BUYER

#### **Upgradable system for excitation and emission photoluminescence measurements of solid-state and liquids sample (Spectrofluorometer)**

##### **Technical specification**

This bid applies to purchase of a system for measuring both excitation and emission photoluminescence (PL) spectra of solid-state, film, powder and liquid samples in the visible spectral range (excitation spectra: at least 210 nm – 800 nm, emission spectra – at least 250 nm – 850 nm).

The system must include the following parts:

- Excitation sources in the UV & visible spectral ranges;
- True double excitation monochromator with gratings;
- Sample compartment including sample holders for all kind of samples: liquid sample in cell, powders, films, bulks etc.;
- True double emission monochromator with gratings and filters;
- Visible spectral range detector: the detector must be able to work in both steady state and phosphorescence mode regarding future upgrades;
- Computer work station, mouse and monitor with English software for the device control and data acquisition.

In the future, the system should have the possibility to receive the following upgrade and extensions:

- Possibility to extend the excitation wavelength range of the system lamp down to 180 nm using the original source delivered with the system;
- Possibility to install a temperature controlled sample holder for all kind of measurements performed on the system;
- Possibility to detect phosphorescence lifetime after an additional installation of only a pulsed light source using standard phosphorescence transient digitizing acquisition electronics delivered with the system;

The final price of the system must include all mentioned in the specification parts for acquisition of PL spectra (both excitation and emission), the delivery, insurance,



installation, training service and warranty for at least 12 months. The details of required parameters are given in the tables below.

**Table 1. Excitation sources**

| <b>Parameter name</b>      | <b>Required technical and functional specifications</b>  |
|----------------------------|--|
| Lamp                       | Ozone-free arc lamp  |
| Power                      | Not less than 70 W   |
| Spectral range of emission | at least 210 nm – 800 nm, possibility to extend the lamp emission spectra down to 180 nm, being still ozone-free |
| Connections                | All necessary for operation cables, electronics, controllers, cooling systems, mechanical supports etc.          |

**Table 2. Excitation monochromator**

| <b>Parameter name</b>    | <b>Required technical and functional specifications</b>   |
|--------------------------|---|
| Scheme                   | Czerny-Turner, true double-grating monochromator including entrance, intermediate (between the two filtering stages) and exit all software-controlled slits |
| Focal distance           | Not less than 2x350 mm  |
| Straight light rejection | Not worse than $\sim 10^{-10}$  |



|          |  |
|----------|--|
| Gratings | Grating turrets allowing the possibility to mount up to 3 sets of gratings and delivered with gratings with the maximum sensitivity at around 300 nm |
|----------|--|

**Table 3. Sample compartment**

| <b>Parameter name</b>                             | <b>Required technical and functional specifications</b>  |
|---|--|
| Type of measured samples                          | Solid-state, film, powder, liquid samples  |
| Optical system                                    | Must have optical elements (reflective optics, achromatic mirrors etc.) insuring the requested 35 000:1 fluorescence sensitivity (Table 7) (FSD method, measured in the standard conditions)   |
| External source excitation                        | Possibility of introduction of a laser beam from external pulsed (ps, fs) laser (Pharos from Light Conversion and Astrella from Coherent) into the sample compartment. Possibility of the laser synchronisation with the system during further optional upgrading. |
| High temperature accessories (5 – 120 °C or more) | Possibility of installation during further optional upgrading.   |
| Integrating sphere                                | Possibility of installation during further optional upgrading.   |





|  |  |
|--|--|
| Absorbance/Transmittance   | Possibility of installation during further optional upgrading. |
| Low temperature accessories (liquid nitrogen – room temperature) | Possibility of installation during further optional upgrading. |
| Flow measurement   | Possibility of installation during further optional upgrading. |

**Table 4. Detection monochromator**

| <b>Parameter name</b>    | <b>Required technical and functional specifications</b>   |
|--------------------------|---|
| Scheme                   | Czerny-Turner, true double-grating monochromator including entrance, intermediate (between the two filtering stages) and exit all software-controlled slits |
| Focal distance           | Not less than 2x350 mm  |
| Straight light rejection | Not worse than $\sim 10^{-10}$  |
| Gratings                 | Grating turrets allowing the possibility to mount up to 3 sets of gratings and delivered with gratings with the maximum sensitivity at around 600 nm        |
| Detectors                | Possibility of installation up to 3 different detectors during further optional upgrading   |



**Table 5. Signal detectors**

| <b>Parameter name</b> | <b>Required technical and functional specifications</b>   |
|-----------------------|---|
| Type                  | Photomultiplier tube (PMT) to be used in photon counting mode and (time-correlated single photon counting/multichannel scaler) TCSPC/MCS lifetimes, Analog steady state and Transient Digitizer modes |
| Spectral range        | At least 200 nm – 900 nm  |
| Detector cooling      | Peltier-cooling   |
| Dark count            | 10 counts/second or less  |
| Maximum count rate    | 1 000 000 or higher   |

**Table 6. Software**

| <b>Parameter name</b> | <b>Required technical and functional specifications</b>                                |
|-----------------------|--|
| Language              | English (mandatory) / others (optional)  |
| System control        | Software control of all system parts and data acquisition                              |
| Calibration           | Possibility of automatic spectrum calibration depending on used optics and electronics |
| Type of measurements  | Excitation spectra<br>Emission spectra   |



|             |  |
|-------------|--|
|             | <p>Kinetics</p> <p>Time-resolved measurements (single acquisition and automatic set of measurements during a certain time)</p> <p>Excitation-emission mapping and constant wavelength analysis</p> |
| Data saving | ASCII text format (mandatory) / others   |

**Table 7. General requirements**

| <b>Parameter name</b>  | <b>Required technical and functional specifications</b>   |
|--|---|
| Signal-to-noise ratio based on water Raman signal (FSD method) | 35 000:1 or more (without optical filters, smoothing of data, repeated scans etc.), FSD method, measured in the standard conditions |
| Spectral resolution  | 0.1 nm and less   |
| Corrections  | Excitation and emission (optics, electronics etc.) spectra corrections  |
| Optical filters  | A set of filters to reject straight light, second and higher order signals, bandpass filters etc.                                   |
| System managing  | Computer workstation, mouse, monitor, software  |



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## **ANNEX 2**

### **TECHNICAL SPECIFICATION OF THE SELLER**

## Technical specification

We are offering modular upgradeable system **FLS1000-D350D350** (manufacturer Edinburgh Instruments) for excitation and emission photoluminescence measurements of solid-state and liquids sample. The instrument has a guaranteed sensitivity of >35 000:1 for the Signal to Noise Ratio of the water Raman signal measured in the standard conditions (FSD method). The FLS1000-D350D350 provides a spectral resolution of 0.1 nm and includes all necessary excitation and emission spectra corrections.

The system includes the following parts:

### 1. Excitation source N-A01-U

450 W ozone-free arc lamp, spectral range of emission 210-1000 nm, possibility to extend the lamp emission spectra down to 180 nm, being still ozone-free

### 2. Excitation monochromator X-DMX-350

Czerny-Turner design, true double-grating monochromator including entrance, intermediate (between the two filtering stages) and exit all software-controlled slits, focal length 2 x 350 mm, stray light suppression greater than  $10^{-10}$ , grating turrets allowing the possibility to mount up to 3 sets of gratings, delivered with gratings with the maximum sensitivity at around 300 nm

### 3. Sample compartment FLS1000Base

Including sample holders for liquid, solid-state, film, powder samples, having optical elements insuring the requested 35 000:1 fluorescence sensitivity (FSD method, measured in the standard conditions)

### 4. Emission monochromator X-DMM-350

Czerny-Turner design, true double-grating monochromator including entrance, intermediate (between the two filtering stages) and exit all software-controlled slits, focal length 2 x 350 mm, stray light suppression greater than  $10^{-10}$ , grating turrets allowing the possibility to mount up to 3 sets of gratings, delivered with gratings with the maximum sensitivity at around 600 nm, possibility of installation up to 3 different detectors

### 5. Signal detector PMT928P with acquisition electronics

Photomultiplier tube allowing measurement in photon counting mode, TCSPC/MCS mode, analog steady state and transient modes, Peltier-cooling, dark count rate: 10 cps, count rate: 1000000, spectral range 200 - 900 nm

## **6. Reference detector N-F01**

For recording excitation intensity incident at the sample, wavelength coverage 200 - 1000 nm

## **7. Filter set N-RSet**

Filters to reject straight light, second and higher order signals, for band-pass

## **8. Computer, monitor, keyboard, mouse (N-Comp)**

## **9. English software Fluoracle for the device control and data acquisition (N-P01)**

Control of all system parts and data acquisition, possibility of automatic spectrum calibration depending on used optics and electronics, data saving in ASCII text format, type of measurements:

- Excitation spectra
- Emission spectra
- Kinetics
- Time-resolved measurements (single acquisition and automatic set of measurements during a certain time)
- Excitation-emission mapping and constant wavelength analysis
- ...

The offered system enables the following upgrades and extensions in the future

- Possibility of introduction of a laser beam from external pulsed (ps, fs) laser (Pharos from Light Conversion and Astrella from Coherent) into the sample compartment. Possibility of the laser synchronization with the system.
- Possibility to install high temperature accessories (5 – 120 °C)

- Possibility to install low temperature accessories (liquid nitrogen – room temperature)
- Possibility to install flow measurement accessories
- Possibility to install integrating sphere (QY measurement)
- Possibility to install absorption detector (absorbance/transmittance measurement)
- Possibility to extend the excitation wavelength range of the system lamp down to 180 nm using the original source delivered with the system.
- Possibility to detect phosphorescence lifetime after an additional installation of only a pulsed light source using standard phosphorescence acquisition electronics delivered with the system

Our system meets all the required technical parameters given by the contracting authority. Delivery, insurance, installation, training service and warranty of 12 months are included.