

## LOT 7

### 1. Benchtop NMR

**Only Brands from Europe, North America, or Japan are acceptable.**

#### Benchtop NMR

##### BENCHTOP FTNMR 80 MHZ WITH PULSE FIELD GRADIENT

The 80 MHz multi-nuclear benchtop NMR instrument shall offer high-performance, low-field spectroscopy in a compact design. The system must allow easy analysis of protons and multiple X-nuclei such as  $^{13}\text{C}$ ,  $^{15}\text{N}$ ,  $^{19}\text{F}$ ,  $^{31}\text{P}$ , and  $^{29}\text{Si}$  without manual tuning or advanced expertise. With one-touch experiment setup, the instrument shall be ideal for teaching, structural analysis, polymer studies, and real-time reaction monitoring.

- Should provide minimum measurement time for sufficiently concentrated samples
- Should support solvent suppression
- Use pre-defined experimental setups in GoScan/TouchScreen Pad or Desktop Software with full NMR functional

Pulsed Field Gradient: - Probe equipped with an one-axis gradient

- Full linear gradient
- Gradient: 5 A max. current
- Gradient power:  $>0.25 \text{ T/m}$  ( $> 25 \text{ G/cm}$ )
- Gradient shape resolution: 18 bit
- Gradient time resolution: 10  $\mu\text{s}$

- Cryogen-free permanent magnet
- No new infrastructure required
- Compact footprint
- Installs on bench or in fume hood
- Minimal cost of ownership
- no liquid nitrogen or helium required
- no water cooling required
- power consumption typically  $<300 \text{ W}$
- power: 100 – 240 V, 50 – 60 Hz
- no additional venting required
- Nuclei: Multinuclear probe supporting proton and at least 15 X-nuclei:  $^1\text{H}$ ,  $^2\text{H}$ ,  $^7\text{Li}$ ,  $^{11}\text{B}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$ ,  $^{19}\text{F}$ ,  $^{23}\text{Na}$ ,  $^{27}\text{Al}$ ,  $^{29}\text{Si}$ ,  $^{31}\text{P}$ ,  $^{51}\text{V}$ ,  $^{77}\text{Se}$ ,  $^{79}\text{Br}$ ,  $^{119}\text{Sn}$ ,  $^{129}\text{Xe}$
- Gradient power:  $> 0.25 \text{ T/m}$  ( $> 25 \text{ G/cm}$ )
- $^1\text{H}$  Sensitivity:  $^1\text{H}/^{13}\text{C}$  system with  $^1\text{H}$  sensitivity of  $\geq 180:1$  or  $\geq 160:1$  when PFG incl. (1% ethyl benzene)
- $^1\text{H}$  Resolution:

$< 0.4 \text{ Hz @ } 50\% \text{ peak height}$

$< 16 \text{ Hz @ } 0.55\% \text{ peak height}$

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| <ul style="list-style-type: none"> <li>• Digital Lock external (no deuterated solvents needed)</li> <li>• Capable of 1D and 2D NMR experiments, including: <sup>1</sup>H, <sup>13</sup>C, DEPT, COSY, HSQC, HMBC, and relaxation studies (T1/T2)</li> <li>• Sample Tubes: standard 5mm diameter, 7''-long NMR tubes, 600 ul sample volume (~ 40 mm filling height)</li> <li>• Lab Temperature and Stability: 18-28°C</li> <li>• Should include a software bundle which includes Mnova NMR + Predict + Verify.</li> </ul> <p>Software to visualize, process, analyze and report your 1D and 2D NMR data AND accurate prediction of <sup>1</sup>H and <sup>13</sup>C NMR spectra from a chemical structure AND Automatic confirmation of structure identity. perpetual workstation licence ACA</p> <ul style="list-style-type: none"> <li>• Create and modify workflows, pulse sequences, parameter sets, AU programs</li> <li>• Use high-field system workflows on the benchtop</li> <li>• Bench PC with Touchscreen</li> <li>• System should Integrate with ELNs, LIMS, and lab automation systems</li> <li>• System should be compatible with Advance Chemical Profiling software</li> </ul> |
| Two year warranty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## LOT 8

1. Digital Multimeter :Multimetre RLC UT60A
2. Digital Multimeter : Multimetre 4000 points MS8239C
3. Digital Multimeter : Fluke 115, 0.5 % +2 digits, Portable
4. Digital Multimeter : Fluke 175, 0.5 % +2 digits, Portable
5. Digital Multimeter : Fluke 279 FC True-rms Thermal Multimeter, Apple Andriod, Portable
6. Digital Multimeter :EDU34450A Smart Bench Essentials Digital Multimeter | Keysight, USB/ETH, Table
7. Digital Multimeter :B&K Precision Corporation, USB/RS232, Table
8. UV/Vis Spectrometer
9. Quantum Cryptography Analogy
10. Quantum Eraser
11. Optical Microscopy
12. RASPBERRY PI 5
13. NVIDIA Jetson Orin Nano Developer Kit
14. Arduino Tiny Machine Learning Kit
15. Charge spécifique de l'électron (rapport e/m)
16. Diffusion compton de rayons X
17. Determining the efficiency of the heat pump experiment set
18. Investigating spontaneous gas discharge in air as a function of pressure Set
19. Observing the normal Zeeman effect in transverse and longitudinal configuration using a Fabry-Perot etalon Set
20. Detection of Muons set
21. Observing a mixture of liquid and gas at the critical point
22. Investigating the Doppler effect with ultrasonic waves

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7. Digital Multimeter :B&K Precision Corporation, USB/RS232, Table
8. UV/Vis Spectrometer

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| Evolution™ One/One Plus UV-Vis Spectrophotometers, 1nm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Cary 5000 UV-Vis-NIR Spectrophotometer, UV-Vis 0.01 - 5.00 nm, NIR 0.04 - 20 nm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>9. Quantum Cryptography Analogy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| EDU-QCRY1/M, Demonstration Kit, Metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>10. Quantum Eraser</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| EDU-OMC1/M , Demonstration Kit, Metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>11. Optical Microscopy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| EDU-QE1/M , Course Educational Kit, Metric, Full course kit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>12. RASPBERRY PI 5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 8 GB WITH ADAPTER AND HEATSINK WITH FAN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>13. NVIDIA Jetson Orin Nano Developer Kit</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Developer Kit Content (P3766) > Jetson Orin Nano™ 8GB module with heat sink and reference carrier board > DC Power Supply > 802.11ac/abgn wireless network interface controller > Quick Start Guide Jetson Orin Nano 8GB Module > NVIDIA Ampere architecture with 1024 NVIDIA® CUDA® cores with 32 tensor cores > 6-core Arm® Cortex-A78AE v8.2 64-bit CPU > 8GB 128-bit LPDDR5 68 GB/s > Supports for external NVMe Reference carrier board > 2x MIPI CSI-2 22-pin camera connectors > 2x M.2 Key M, M.2 Key E > 4x USB 3.2 Gen2 Type-A > USB Type-C for UFP > Gigabit Ethernet > DisplayPort > microSD slot > 40-pin expansion header > DC power jack |
| <b>14. Arduino Tiny Machine Learning Kit</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| The Tiny Machine Learning Kit, combined with the exciting TinyML Applications and Deploying TinyML on Microcontrollers courses that are part of the Tiny Machine Learning (TinyML) specialization from EdX will equip you with all the tools you need to bring your ML visions to life! The Tiny Machine Learning Kit includes:<br>1 Arduino Nano 33 BLE Sense board<br>1 OV7675 Camera<br>1 Arduino Tiny Machine Learning Shield<br>1 USB A to Micro USB Cable                                                                                                                                                                                         |
| <b>15. Charge spécifique de l'électron (rapport e/m)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <b>16. Diffusion compton de rayons X</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Contient deux expériences : effet Compton et Diffraction R.X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>17. Determining the efficiency of the heat pump experiment set</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Heat pump, Joule and wattmeter, data logger, adapters, temperature probes, stop watch, full experiment set.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>18. Investigating spontaneous gas discharge in air as a function of pressure Set</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Discharge tube, canal rays, Rotary-vane vacuum pump, Male ground joint, ST 19/26, DN 16 KF, Cross piece, DN 16 KF, Clamping ring, Centering ring, Fine vacuum ball valve, Variable leak valve, Pirani vacuum gauge with display, High-voltage power supply, 10 kV, Cable for high voltages, Exhaust filter, full experiment set                                                                                                                                                                                                                                                                                                                         |
| <b>19. Observing the normal Zeeman effect in transverse and longitudinal configuration using a Fabry-Perot etalon Set</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| Spectral lamp, Cd, with holding plate, U-core with yoke, Coil 480 turns 10 A, AC/DC power supply 0...24 V/0...10 A, Fabry-Perot etalon mirror in holder, Lens in frame $f=150$ mm, Quarter-wavelength plate 140 nm, Polarization filter, Interference filter 644 nm, Ocular with scale, Optical bench with standardized profile, Optics rider 60/50 |                                                                    |
| <b>20.</b>                                                                                                                                                                                                                                                                                                                                          | <b>Detection of Muons set</b>                                      |
|                                                                                                                                                                                                                                                                                                                                                     |                                                                    |
| <b>21.</b>                                                                                                                                                                                                                                                                                                                                          | <b>Observing a mixture of liquid and gas at the critical point</b> |
| Pressure chamber for demonstrating the critical temperature, Lamp housing with cable, Condenser with diaphragm holder, Transformer 6/12 V, Lens in frame, $f=100$ mm, Screen, Optical bench, Stirring thermometer $-10...+110$ °C, Steam generator, Silicone tubing, full experiment set                                                            |                                                                    |
| <b>22.</b>                                                                                                                                                                                                                                                                                                                                          | <b>Investigating the Doppler effect with ultrasonic waves</b>      |
| Ultrasonic transmitter, Ultrasonic receiver, AC amplifier, Generator 40 kHz, Precision metal rail 100 cm, Rail connector, Accessories for acoustic Doppler effect, Hand-held stop-watch, stand ring with clamp, Connecting lead, full experiment set                                                                                                |                                                                    |
| Two year warranty                                                                                                                                                                                                                                                                                                                                   |                                                                    |

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