



UNIVERSITY OF SARAJEVO  
FACULTY OF PHARMACY

# **EQUIPMENT CATALOGUE FACULTY OF PHARMACY UNIVERSITY OF SARAJEVO**

**SARAJEVO, 2020.**

### **Dean's word**

The Faculty of Pharmacy of University of Sarajevo applies modern educational and research methods with the aim of educating masters of pharmacy who are fully trained for professional and responsible work in all areas of pharmaceutical science. Carrying out the teaching and scientific process and monitoring modern trends is impossible without adequate equipment.

Therefore, the scientific and professional base of the Faculty has been strengthened and the procurement and modernization of the equipment available to the Faculty has been carried out. Our students are enabled to acquire knowledge and acquire the skills necessary for future work, and our employees are encouraged to continue their successful research work.

The catalog of equipment of the Faculty of Pharmacy, University of Sarajevo contains a list of the most important equipment and represents a mirror of the work and potential of our Faculty. At the same time, the catalog represents an opportunity for new collaborations as well as better mutual cooperation of our employees with the aim of achieving enviable scientific results.

I sincerely hope that the above equipment will contribute to the mentioned goals.

**Sarajevo, 2020.**

**Dean**

**Full professor, Fahir Bečić, PhD, MPharm**

**Designed by:**


Belma Pehlivanović, PhD, MPharm


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<b>Device</b>	<b>Ugo Basile™ Plethysmometer</b>
<b>Model</b>	Ugo Basile Srl. Italy /Model No. 7141; Lot No. 18658.
<b>Picture</b>	
<b>Application</b>	In vivo study of anti-inflammatory and antiedematous activity in a rat and mouse model.
<b>Technical characteristics</b>	Ugo Basile™ Plethysmometer is a microprocessor volume meter that is a standard instrument for measuring rat / mouse paw volume. The measuring cell consists of 2 vertically connected Perspex tubes into which a rat / mouse paw is applied (Larger tube: 1.8 cm; Smaller tube: 1.3 cm). Volt. 100-240; Hz. 50/60; Warr. 20
<b>Contact</b>	Full professor Fahir Bečić, PhD, MPharm Department of Clinical Pharmacy <a href="mailto:fahir.becic@ffsa.unsa.ba">fahir.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Ugo Basile™ Hot / Cold plate</b>
<b>Model</b>	Ugo Basile Srl/Model Cat. No. 35150
<b>Picture</b>	
<b>Application</b>	Examination of analgesia of in vivo model of acute, subacute and chronic pain in rats and mice.
<b>Technical characteristics</b>	Ugo Basile™ hot / cold plate is a standard test of thermal pain in rats / mice. Temperature range: - 5.0 ° C to 65.0 ° C
<b>Contact</b>	Full professor Fahir Bečić, PhD, MPharm Department of Clinical Pharmacy <a href="mailto:fahir.becic@ffsa.unsa.ba">fahir.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Biosan CVP-2 Centrifuge/Vortex for PCR plates</b>
<b>Model</b>	BS-010219-A02
<b>Picture</b>	
<b>Application</b>	The CVP-2 is a fully automated device for simultaneous reproduction of the "spin-mix-spin algorithm" for two PCR plates, which saves a lot of time. The instrument finds its application in the laboratory for PCR and DNA analysis. CVP-2 combines: centrifuge, vortex and centrifuge / vortex
<b>Technical characteristics</b>	<p>Speed range: 300–1500 rpm  Vortex range: 300–1200 rpm  Screen: LCD  Number of cycles: 1-999  Weight: 6.15 kg</p>
<b>Contact</b>	<p>Associate Professor Tanja Dujic, PhD, MPharm  Department of Biochemistry and Clinical Analysis  <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a></p>

<b>Device</b>	<b>QuantStudio™ 5 Real-Time PCR</b>
<b>Model</b>	A34322/2017
<b>Picture</b>	
<b>Application</b>	<p>The Applied Biosystems QuantStudio 5 Real-Time PCR System for Human Identification is the instrument designed for both new and experienced users who need a simple, reliable and affordable real-time PCR system. This system offers a sensitive, robust solution for forensic DNA quantification.</p> <p>QuantStudio™ 5 The real-time PCR instrument uses polymerase chain reaction (PCR) and fluorescent reagents to:</p> <ul style="list-style-type: none"> <li>• Quantitative determination of target nucleic acid sequences (targets)</li> <li>• Qualitative target detection (endpoint analysis, genotyping and presence / absence)</li> </ul>
<b>Technical characteristics</b>	<p>10 GB of built-in memory to store 2,000 to 5,000 analysis  96-well format  0.2 mL  Touchscreen screen  Human identification (HID) -valid system</p>
<b>Contact</b>	<p>Associate Professor Tanja Dujic, PhD, MPharm  Department of Biochemistry and Clinical Analysis  <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Shimadzu BioSpec-nano</b>
<b>Model</b>	
<b>Picture</b>	
<b>Application</b>	The BioSpec-nano is a spectrophotometer suitable for testing the concentration of nucleic acids (DNA and RNA) in samples. The amount of DNA and RNA can be determined quickly and easily in a very small amount of sample (1µL)
<b>Technical characteristics</b>	<p>Wavelength range: 220 - 800 nm  Precision for wavelength adjustment: <math>\pm 1</math> nm  Road length: 0.2 mm, 0.7 mm (manual selection)  Light source: Xenon flash lamp  Detector: Photo diode array  Quantification range (OD, dsDNA concentration):</p> <ul style="list-style-type: none"> <li>• Road length 0.2 mm (50-3,700 ng / µL)</li> <li>• Road length 0.7 mm (15-1,000 ng / µL)</li> <li>• Path length 5 mm Optional (2-150 ng / µL)</li> </ul>
<b>Contact</b>	Associate Professor Tanja Dujic, PhD, MPharm Department of Biochemistry and Clinical Analysis <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a>





<b>Device</b>	<b>BioRad T100™ Thermal Cycler</b>
<b>Model</b>	1861096
<b>Picture</b>	
<b>Application</b>	<p>The T100 Thermal Cycler is an instrument used to perform polymerase chain reaction (PCR). Thermal gradient technology allows precise temperature adjustment during each analysis which enhances the polymerase chain reaction. T100 Thermal Cycler is used for:</p> <ul style="list-style-type: none"> <li>• Nucleic acid amplification</li> <li>• Gene cloning and analysis</li> <li>• Gene expression analysis</li> <li>• Mutation analysis</li> <li>• Cyclic sequencing</li> </ul>
<b>Technical characteristics</b>	<p>Sample capacity: 96 x 0.2 ml tubes; 96-well plate  Temperature range: 4–100 ° C  Temperature accuracy: ± 0.5 ° C for the target temperature  Screen: 5.7 " VGA color touch screen</p>
<b>Contact</b>	<p>Associate Professor Tanja Dujić, PhD, MPharm  Department of Biochemistry and Clinical Analysis  <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Biotek ELx800 Microplate Reader</b>
<b>Model</b>	
<b>Picture</b>	
<b>Application</b>	The ELx800™ is a compact, ideally suited microplate reader for use in the clinical and research laboratory. It is used for kinetic measurements as well as scanning and measuring samples on microplates from 6 to 384 wells. This instrument is used to determine parameters by immunoenzymatic (ELISA) methods. The working principle is based on spectrophotometric determination based on the measured absorbance at certain wavelengths
<b>Technical characteristics</b>	Wavelength range: 340 - 750 nm Filters: 340, 405, 450, 490, 630 nm Data can be saved on the device, printed or stored on a computer
<b>Contact</b>	Associate Professor Tanja Dujić, PhD, MPharm Department of Biochemistry and Clinical Analysis <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Vilber Transilluminator – visualize DNA and PCR fragments</b>
<b>Model</b>	ECX-F20.BLUE V1 - LED SKYLIGHT
<b>Picture</b>	
<b>Application</b>	Transilluminator for the visualisation of nucleic acids (DNA) and PCR fragments. The 470 nm Skylight blue LED transilluminator is ideal for visualising Midori Green™ or SYBR® dyes without exciting them with UV.
<b>Technical characteristics</b>	Dimensions (L x B x H) 330 x 320 x 130 mm Weight 6.3 kg Work area 260 x 210 mm Power 2 A
<b>Contact</b>	Associate Professor Tanja Dujić, PhD, MPharm Department of Biochemistry and Clinical Analysis <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a>

<b>Device</b>	<b>Biosan Intelispeed microplate washer IW-8</b>
<b>Model</b>	BS-060106-IVD1
<b>Picture</b>	
<b>Application</b>	<p>The Intelispeed Washer IW-8 is designed to wash standard 96-well plates during analysis. The appliance is fully programmed to ensure rinsing in several steps (aspiration, rinsing, aspiration-drying). The device has the ability to set 100 programs defined by the user. In addition, the appliance can be used for rinsing the plates with different depths of wells.</p> <p>The unit provides various:</p> <ul style="list-style-type: none"> <li>-Washing methods</li> <li>-Rinsing methods</li> <li>-Mixing methods</li> </ul>
<b>Technical characteristics</b>	<p>Maximum working volume: 1600 <math>\mu</math>l  Minimum working volume: 25 <math>\mu</math>l  Accuracy: <math>\pm</math> 2.5%  Number of wells to be flushed simultaneously: 8  Aspiration time: 0.2–3 s  Aspiration / operation speed: 3 levels  Number of rows that can be washed: 1 - 12  Number of possible programs: 101  Weight: 9.6 kg</p>
<b>Contact</b>	<p>Associate Professor Tanja Dujic, PhD, MPharm  Department of Biochemistry and Clinical Analysis  <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Biosan PST-100HL, Plate Shaker-Thermostat</b>
<b>Model</b>	BS-010142-AAI
<b>Picture</b>	
<b>Application</b>	<p>The Plate Shaker-Thermostat is designed to provide constant shaking and thermostating of 2 standard 96-well plates. It consists of 3 independent devices:</p> <ul style="list-style-type: none"> <li>Incubator</li> <li>Microwave shaker</li> <li>Thermo-Shaker</li> </ul> <p>The PST-100HL thermo-shaker with the ability to stabilize temperatures up to 100 ° C is specially designed for hybridization reactions.</p> <p>Plate Shaker - Thermostat offers:</p> <ul style="list-style-type: none"> <li>Shaking the sample</li> <li>Regulation, stabilization and indication of speed of movement</li> <li>Time settings</li> <li>Automatic stopping of the platform after the set time has elapsed</li> <li>Setting and specifying the required temperature on the platform</li> </ul> <p>The device is mostly used in the fields:</p> <ul style="list-style-type: none"> <li>Cytochemistry - for <i>in situ</i> reactions</li> <li>Immunochemistry - for enzyme-linked immunosorbent assays</li> <li>Biochemistry - for enzyme and protein analysis</li> <li>Molecular biology - "Microarray" analysis</li> </ul>
<b>Technical characteristics</b>	<p>Temperature range: +25 ° C ... +100 ° C</p> <p>Speed range: 250–1200 rpm</p> <p>Screen: LCD</p> <p>Number of tiles: 2</p> <p>Weight: 5.9 kg</p>
<b>Contact</b>	<p>Associate Professor Tanja Dujic, PhD, MPharm  Department of Biochemistry and Clinical Analysis  <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Turner Designs TD-700 Fluorometer</b>
<b>Model</b>	
<b>Picture</b>	 A photograph of the Turner Designs TD-700 Fluorometer. It is a white, boxy laboratory instrument with a digital display screen at the top showing '10.55' and a keypad below it. The front panel has a label that reads 'TD-700 Fluorometer' and 'Turner Designs, Sunnyvale, CA'.
<b>Application</b>	The TD-700 Fluorometer is used in the laboratory for the purpose of identifying compounds that have the ability to fluoresce. Fluorometry is one of the most commonly used analytical methods. The re-emission (fluorescence) ability is monitored using an optical filter and a suitable lamp
<b>Technical characteristics</b>	Detector: Factory fitted photometric tube Standard: 300 - 650 nm Sensitivity: 185 - 870 nm Lamp: Quartz Halogen or mercury vapor lamp under low pressure Operating temperature: 15 - 36 ° C Weight: 5.9 kg
<b>Contact</b>	Associate Professor Tanja Dujic, PhD, MPharm Department of Biochemistry and Clinical Analysis <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Hettich Mikro 22R Centrifuge</b>
<b>Model</b>	1110
<b>Picture</b>	
<b>Application</b>	The Hettich Mikro 22R Centrifuge is used to prepare different types of samples in the laboratory. It has the ability to adjust the speed, temperature and spin time. The application of different rotors allows the centrifugation of a large number of samples simultaneously
<b>Technical characteristics</b>	Analysis volume: 0.2 - 2.0 ml Temperature range: -20 ° C to +40 ° C Memory: 3 programs
<b>Contact</b>	Associate Professor Tanja Dujic, PhD, MPharm Department of Biochemistry and Clinical Analysis <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a>


<b>Device</b>	<b>AUTOCLAVE HMT 232 N</b>
<b>Model</b>	6266840*LLG
<b>Picture</b>	
<b>Application</b>	The HMT 232N is an easy-to-use semi-automatic autoclave with high reliability and safety. It is aimed for use in laboratories for sterilization of objects, liquids, etc. The chamber consists of stainless steel that is easy to clean. Several different programs can be set
<b>Technical characteristics</b>	Available temperatures: 121 ° C and 134 ° C Adjustable sterilization pressure: from 0.9 to 2.1 bar. The following settings are available for sterilization: 4 minutes / 15 min / 30 min. Automatic control until the end of the sterilization process
<b>Contact</b>	Associate Professor Tanja Dujic, PhD, MPharm Department of Biochemistry and Clinical Analysis <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a>





<b>Device</b>	<b>GFL Water Bath</b>
<b>Model</b>	1003
<b>Picture</b>	
<b>Application</b>	GFL Water bath is used in the laboratory to perform analysis that require a controlled and constant incubation temperature. It is easy to use and allows rapid reaching the desired temperature
<b>Technical characteristics</b>	Capacity: 14l Temperature range: approx. 5 ° C above ambient to 99.9 ° C Display: LED with temperature adjustment at intervals of $\pm 0.1$ ° C Weight: 12.5 kg
<b>Contact</b>	Associate Professor Tanja Dujić, PhD, MPharm Department of Biochemistry and Clinical Analysis <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a>


<b>Device</b>	<b>ARCTIKO ULUF 450-2M® Ultra Low Temperature Freezer</b>
<b>Model</b>	DAI 1414
<b>Picture</b>	
<b>Application</b>	ARCTIKO ULUF 450-2M® is freezer which enables storage and disposal of different types of samples at temperature: -40 °C do -86 °C.
<b>Technical characteristics</b>	Temperature: -40 to -86 °C Max. room temperature: 25 °C Capacity: 393 L Weight: 175 kg
<b>Contact</b>	Associate Professor Tanja Dujic, PhD, MPharm Department of Biochemistry and Clinical Analysis <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Analytical scale Mettler Toledo AT Balance</b>
<b>Model</b>	AT 400
<b>Picture</b>	
<b>Application</b>	Weighing of small amounts of samples
<b>Technical characteristics</b>	Maximal weigh capacity: 405 g Readability: 0.1 mg Linearity: $\pm 0.5$ mg Time of stabilization: 4-6 sec
<b>Contact</b>	Associate Professor Tanja Dujić, PhD, MPharm Department of Biochemistry and Clinical Analysis <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a>

<b>Device</b>	<b>BioSan UVC/T-AR DNA/RNA UV-cleaner box</b>
<b>Model</b>	BS-040102-AAA
<b>Picture</b>	
<b>Application</b>	<p>DNA / RNA UV-cleaner chamber UVC / T-AR is designed for sterile work with DNA. Chamber with UV cleaner enables protection from any kind of contamination. These chambers are equipped with UV lamp. UV radiation is disinfecting the working area by inactivating the fragments of DNA/RNA in the exposure period of 15 to 30 min. Digital timer is controlling the duration of direct UV radiation. Daylight Bulb is enabling the proper illumination on working space.</p> <p>Chambers with UV-cleaner are equipped with circulating bactericidal UV cleaner/recirculator AR which enables constant decontamination of the chamber during the working session.</p> <ul style="list-style-type: none"> <li>• UV decontamination of high density without ozone</li> <li>• UV lamp with working life of around 9.000 hours</li> <li>• Automatic shutdown timer for UV</li> <li>• Baktericidal recirculator enables permanent decontamination inside chamber during the working session</li> <li>• Almost no noise, very energy efficient</li> </ul>
<b>Technical characteristics</b>	<p>Materials of box: Plexiglas  Level of UV radiation: 15 mW / cm<sup>2</sup> / sec  Type of radiation: UV (<math>\lambda = 253.7</math> nm), ozone-free  Working surface: 645 x 490 mm  Weight: 23/33 kg  Energy consumption: 67 W</p>
<b>Contact</b>	<p>Associate Professor Tanja Dujic, PhD, MPharm  Department of Biochemistry and Clinical Analysis  <a href="mailto:tanja.dujic@ffsa.unsa.ba">tanja.dujic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Biobase / Laboratory Biological Microscope</b>
<b>Model</b>	XS208 Series
<b>Picture</b>	
<b>Application</b>	XS-208 Microscope is used for microscopic analysis of samples. It works on the principle of image magnification, for the purpose of easier qualitative and quantitative analysis, as well as identification of sample.
<b>Technical characteristics</b>	Ocular: WF10X/18mm Lens: 4x, 10x, 40x, 100x Halogen lamp Weight: 8 kg
<b>Contact</b>	Full professor Kemal Durić, PhD, MPharm Department of Pharmacognosy <a href="mailto:kemal.duric@ffsa.unsa.ba">kemal.duric@ffsa.unsa.ba</a>


<b>Device</b>	<b>UV-VIS spektrofotometar ThermoFisher Scientific / UV-VIS Spectrophotometer</b>
<b>Model</b>	Evolution™ 60S
<b>Picture</b>	
<b>Application</b>	Spectrophotometric assessment of unknown analyt dilution is done on basis of luminosity absorption in visible or UV part of spectrum. Existing configuration methods are including concentration measurement as well as ratio of nucleic acids and proteins.
<b>Technical characteristics</b>	Luminosity source: xenon lamp Width of spectral line:1.0 nm Optical design: „dual-beam“ optical configuration with inside referent detector; Detector – twofold silicon photodiode; Measuring surface: 190-1100 nm; Rotational stand for 6 cuvettes (blank probe + 5 samples), simultaneously; Data analysis with the use of software.
<b>Contact</b>	Full professor Kemal Durić, PhD, MPharm Department of Pharmacognosy <a href="mailto:kemal.duric@ffsa.unsa.ba">kemal.duric@ffsa.unsa.ba</a>


<b>Device</b>	<b>Rotating Vacuum Evaporator Ingos</b>
<b>Model</b>	RVO 200 A / 2004
<b>Picture</b>	
<b>Application</b>	Evaporation of organic solvents (polar and nonpolar); Vacuum pump are lowering the pressure on its own.
<b>Technical characteristics</b>	Rotavapor: Span of turns: 10-200 rpm Temperature: max. 100 °C (water) / $\pm 1^{\circ}\text{C}$ max. 180 °C (oil) / $\pm 3^{\circ}\text{C}$ Measurement: two thermometers (platinum) Difference in pressure: 50 hPa (adjustable) Weight: 16 kg Vacuum pump with vacuum control (working pressure 1bar, Hz: 50, kW: 120) with PTFE- membranes
<b>Contact</b>	Full professor Kemal Durić, PhD, MPharm Department of Pharmacognosy <a href="mailto:kemal.duric@ffsa.unsa.ba">kemal.duric@ffsa.unsa.ba</a>


<b>Device</b>	<b>UV-viewing cabinet Spectroline®</b>
<b>Model</b>	CM 24-A (CM-10A chambre with UV-lamp ENF-240C)
<b>Picture</b>	
<b>Application</b>	Observation of chromatograms obtained with thin-layer chromatography and other objects under UV light of 254nm and 365nm wave length.
<b>Technical characteristics</b>	4W, 365nm by 300μW/cm <sup>3</sup> and 254nm by 310μW/cm <sup>3</sup> Dimensions: 22.9 x 30.5 x 16.5 cm Weight: 3,2 kg
<b>Contact</b>	Full professor Kemal Durić, PhD, MPharm Department of Pharmacognosy <a href="mailto:kemal.duric@ffsa.unsa.ba">kemal.duric@ffsa.unsa.ba</a>





<b>Device</b>	<b>High speed countercurrent chromatograph CCC-1000</b>
<b>Model</b>	PTR Pharma tech research CORP, Maryland, USA
<b>Picture</b>	
<b>Application</b>	Countercurrent chromatography (CCC, also counter-current chromatography) is a form of liquid–liquid chromatography that uses a liquid stationary phase that is held in place by centrifugal force and is used to separate, identify, and quantify the chemical components of a mixture. In its broadest sense, countercurrent chromatography encompasses a collection of related liquid chromatography techniques that employ two immiscible liquid phases without a solid support
<b>Technical characteristics</b>	
<b>Contact</b>	Full professor Kemal Durić, PhD, MPharm Department of Pharmacognosy <a href="mailto:kemal.duric@ffsa.unsa.ba">kemal.duric@ffsa.unsa.ba</a>


<b>Device</b>	<b>Ultrasonic water bath Nahita</b>
<b>Model</b>	611/6
<b>Picture</b>	
<b>Application</b>	Ultrasonic water „bath“ for sonication biological material, dissolution of liquids, mixing of liquids and compounds, cleaning of components.
<b>Technical characteristics</b>	Capacity: 6L Ultrasonic power: 250W Ultrasonic frequency: 50Hz Heater Counter: 1 - 30 min
<b>Contact</b>	Full professor Kemal Durić, PhD, MPharm Department of Pharmacognosy <a href="mailto:kemal.duric@ffsa.unsa.ba">kemal.duric@ffsa.unsa.ba</a>


<b>Device</b>	<b>Analytical scale Kern</b>
<b>Model</b>	Series 770 – 15
<b>Picture</b>	
<b>Application</b>	Weighing small amount of samples
<b>Technical characteristics</b>	Max weigh capacity: 220g Readability: 0.1mg Reproducibility: 0.1mg Linearity: $\pm 0.2$ mg Stabilization time: 3 sec
<b>Contact</b>	Full professor Kemal Durić, PhD, MPharm Department of Pharmacognosy <a href="mailto:kemal.duric@ffsa.unsa.ba">kemal.duric@ffsa.unsa.ba</a>

<b>Device</b>	<b>Laboratory Centrifuge Tehnica Železniki</b>
<b>Model</b>	LC-320
<b>Picture</b>	
<b>Application</b>	Separation of solids from dispersant in concentrated suspensions or dispersions.
<b>Technical characteristics</b>	Speed: 0 - 6000 turns / min Number of places for samples: 32 Time of process: 0 - 60 min
<b>Contact</b>	Full professor Kemal Durić, PhD, MPharm Department of Pharmacognosy <a href="mailto:kemal.duric@ffsa.unsa.ba">kemal.duric@ffsa.unsa.ba</a>


<b>Device</b>	<b>Laboratory Dryer Sutjeska</b>
<b>Model</b>	
<b>Picture</b>	
<b>Application</b>	Drying and preparation of laboratory utensils
<b>Technical characteristics</b>	
<b>Contact</b>	Full professor Kemal Durić, PhD, MPharm Department of Pharmacognosy <a href="mailto:kemal.duric@ffsa.unsa.ba">kemal.duric@ffsa.unsa.ba</a>


<b>Device</b>	<b>Analytical balance</b>
<b>Model</b>	AX 205 Delta Range, Mettler Toledo
<b>Picture</b>	
<b>Application</b>	Weighing small amounts of sample
<b>Technical characteristics</b>	Readability: 0.01 mg Maximum capacity: 220 g Linearity: $\pm 0.15$ mg Stabilization time: 2-5 s Weighing range: 0-220 g
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Liquid chromatograph (HPLC) with DAD and electrochemical detection</b>
<b>Model</b>	1260 Infinity II LC system
<b>Picture</b>	 <p>The image shows the Agilent 1260 Infinity II LC system, a modular liquid chromatograph. It consists of a pump, injector, column oven, and detector (DAD and electrochemical) stacked vertically. A computer monitor to the right displays a chromatogram with multiple peaks. The system is white and black, with the Agilent logo visible on the top module.</p>
<b>Application</b>	<p>Liquid chromatography is a separation method based on the difference in the distribution of different components of the liquid mixture between mobile (liquid) phase, and stationary (solid or liquid) phase contained in a column. The mobile phase is pumped through column under the high pressure. The components of the mixture are separated based on the mechanisms of adsorption, different solubility, ion exchange, size and mass distribution, or stereochemical interaction. It is used for separation, qualitative and quantitative analysis of different substances. Identification is performed by comparison of retention times between samples and standards.</p>
<b>Technical characteristics</b>	<p>Column Capacity: 4  Depth: 468 mm  Flow range: 0.05 – 5 ml/min with G7112B; 0.2 do 10 ml/min with G7110B, G7111A, G7111B  Injection range: 0.1 – 100 <math>\mu</math>L  Maximum number of solvents: 4  Pump type: isocratic, gradient  System Pressure Operating Range: up to 600 bar  Detection: DAD, electrochemical  Width: 435 mm</p>
<b>Contact</b>	<p>Associate professor Ervina Bečić, PhD, MPharm  Department of Pharmaceutical Analysis  <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Water purifier</b>
<b>Model</b>	Arium mini, Sartorius
<b>Picture</b>	
<b>Application</b>	It is used to prepare ultrapure water for HPLC analysis. It is the water where most of the matter has been removed, so that it is clean enough to meet strict pharmaceutical and medical standards.
<b>Technical characteristics</b>	<p>Water purification method Adsorption by spherical activated carbon, catalyst, reverse osmosis, ion exchange</p> <p>Operating temperature 2°C–35°C at max. 80% relative humidity</p> <p>Type of water ASTM Type 1 ultrapure water</p> <p>Water dispensing flow rate: Up to 1.0 L/min</p> <p>Volume accuracy: <math>\pm 2\%</math> between 0.05 L and 5 L</p> <p>Conductivity: 0.055 <math>\mu\text{S}/\text{cm}</math></p> <p>Microorganisms: <math>&lt; 1</math> CFU/1,000 ml</p> <p>Particle content <math>&gt; 0.2 \mu\text{m}</math>: <math>&lt; 1/\text{ml}</math></p>
<b>Contact</b>	<p>Associate professor Ervina Bečić, PhD, MPharm</p> <p>Department of Pharmaceutical Analysis</p> <p><a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a></p>





<b>Device</b>	<b>UV-VIS Spectrophotometer</b>
<b>Model</b>	Genesys 2, Spectronic
<b>Picture</b>	
<b>Application</b>	It is used for quantitative analysis of solutions and identification of compounds containing chromophores. This method applies to the determination of components in multicomponent mixtures, examining the kinetics of chemical reactions. It analyzes the inorganic and organic compounds dissolved in water and organic solvents, pharmaceutical products, extracts of plant drugs, food samples and biological samples.
<b>Technical characteristics</b>	Wavelength range: 200-1100 nm Accuracy: $\pm 1$ nm Spectral range: 2 nm Number of sample places: 8
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>UV-VIS Spectrophotometer</b>
<b>Model</b>	UVmini-1240, Shimadzu
<b>Picture</b>	
<b>Application</b>	It is used for quantitative analysis of solutions and identification of compounds containing chromophores. This method applies to the determination of components in multicomponent mixtures, examining the kinetics of chemical reactions. It analyzes the inorganic and organic compounds dissolved in water and organic solvents, pharmaceutical products, extracts of plant drugs, food samples and biological samples.
<b>Technical characteristics</b>	<p>Measurement Wavelength Range: 190-1100 nm  Wavelength Scanning Speeds: Switching wavelengths - approximately 3800 nm/min  Wavelength scan - approximately 24-1400 nm/min  Accuracy: <math>\pm 1.0</math> nm  Spectral Band Width: 5 nm  Wavelength setting: 0.1 nm  Measurement method: single beam spectrophotometer  Wavelength Repeatability: <math>\pm 0.3</math> nm  Photometric Accuracy: <math>\pm 0.005</math> Abs (at 1.0 Abs) NIST 930D filter  <math>\pm 0.003</math> Abs (at 0.5 Abs)  Photometric repeatability: <math>\pm 0.002</math> Abs (at 1.0 Abs)</p>
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>UV-VIS Spectrophotometer</b>
<b>Model</b>	Lambda 18, Perkin Elmer
<b>Picture</b>	
<b>Application</b>	It is used for quantitative analysis of solutions and identification of compounds containing chromophores. This method applies to the determination of components in multicomponent mixtures, examining the kinetics of chemical reactions. It analyzes the inorganic and organic compounds dissolved in water and organic solvents, pharmaceutical products, extracts of plant drugs, food samples and biological samples.
<b>Technical characteristics</b>	Wavelength range: 187-900 nm Double beam spectrophotometer with two monochromators Optical unit includes: Prealigned tungsten-halogen lamp and deuterium lamp Spectral bandpas: 0.1-5 nm Large interchangeable sample compartment UV WinLab operating software provides recording, manipulation and storage of spectral data
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>

<b>Device</b>	<b>Spectrofluorophotometer</b>
<b>Model</b>	RF-5301 PC, SHIMADZU
<b>Picture</b>	
<b>Application</b>	<p>Measurement of fluorescence intensity of samples containing fluophores. Fluorescence is a very sensitive method that can detect very low concentrations of the substance (<math>10^{-12}</math> mol/l) and therefore the spectrofluorophotometer is used in drug analysis, biochemistry, organic chemistry, etc. Qualitative analysis is based on the comparison of excitation and emission maxima of the fluorescent substance. Quantitative analysis is based on the linear relation between intensity of fluorescence and concentration of the test substance.</p>
<b>Technical characteristics</b>	<p>Scanning rate: 5.500 nm/min          Light source: Xenon lamp          Wavelength scale: 220 – 990 nm          Spectral bandwidth: 1.5, 3, 5, 10, 15 and 20 nm          Wavelength accuracy: <math>\pm 1.5</math> nm          Sensitivity: The Signal/Noise ratio is 150 or higher          Response: 0.02, 0.03, 0.1, 0.25, 0.5, 2, 4 and 8 s for 98% of the full scale          Interface: RS-223C          Dimensions and weight: 667W x 530D x 270H mm; 43kg          Dimensions of sample compartment: 140 x 170 x 140 mm          Operational temperature range: 15-35°C          PC Requirements: IBM-PC/AT or 100% compatible; i486 or bigger CPU; 8 Mbyte or bigger main memory. Windows version 3.1 or newer</p>
<b>Contact</b>	<p>Associate professor Ervina Bečić, PhD, MPharm          Department of Pharmaceutical Analysis  <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>FT-IR Spectrophotometer</b>
<b>Model</b>	Cary 630 FTIR (ATR), Agilent
<b>Picture</b>	 <p>The image shows an Agilent Cary 630 FTIR (ATR) Spectrophotometer. It is a compact, benchtop instrument with a white and black color scheme. The main body is white, and the sample compartment and detector area are black. A sample is visible in the ATR diamond interface. The Agilent logo is visible on the front panel.</p>
<b>Application</b>	Characterization of samples in solid and semi-solid state. Determination of structure and chemical composition of unknown compounds.
<b>Technical characteristics</b>	<p>Interferometer: 25 mm, Michelson, 45°  Interface of spectrometer: USB-2  Dimensions: 16 x 31 x 13 cm  Sample interface: ATR diamond  Softver: Agilent MicroLab PC software, Automated IQ/OQ, 21 CFR Part 11 compliant, Resolutions Pro for advanced data analysis  Spectral range: KBr 6300–350 cm<sup>-1</sup> ZnSe 5100–600 cm<sup>-1</sup>  Resolution: &lt; 2 cm<sup>-1</sup>  Wavenumber accuracy: 0.05 cm<sup>-1</sup>  Wavenumber reproducibility: 0.005 cm<sup>-1</sup></p>
<b>Contact</b>	<p>Associate professor Ervina Bečić, PhD, MPharm  Department of Pharmaceutical Analysis  <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Refractometer</b>
<b>Model</b>	2WAJ, Optika Microscopes
<b>Picture</b>	
<b>Application</b>	Measurement of refractive index of liquids, solids and sugar solutions. The refractive index is an important optical constant used to determine the optical properties of compounds, their purity, concentration and dispersion.
<b>Technical characteristics</b>	<p>Main prism: Horizontal          Refraction index scale: Nd 1.300 – 1.700          Precision: Nd <math>\pm</math> 0.0003          Sugars scale: 0-95%, Nd 1.300 – 1.530          Precision: 0 – 50 % = 0.2 % ; 51 – 95 % = 0.1 %          Thermometer scale: 0° C – 70° C, div. 1° C          Weight: 4 kg          Size: 140x100x235 mm</p>
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Polarimeter</b>
<b>Model</b>	POL X, Optika Microscopes
<b>Picture</b>	 A black and silver polarimeter instrument mounted on a stand. The instrument has a circular base, a vertical support column, and a horizontal arm with a lens and a viewing eyepiece. A small blue logo is visible on the base.
<b>Application</b>	Measurement of specific rotation of optically active substances. Qualitative and quantitative analyses of optically active compounds.
<b>Technical characteristics</b>	Measuring range of optical rotation: $\pm 180^\circ$ Resolution: $1^\circ$ Accuracy: $0.05^\circ$ Light source: Monochromatic LED, 1.2 W, $\lambda_d = 590$ nm Length of test tubes: 100 mm   200 mm Weight: 1.7 kg Dimensions: 450 x 180 x 320 mm
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Microevaporator</b>
<b>Model</b>	Dri Block 200/3, Techne
<b>Picture</b>	
<b>Application</b>	Rapid evaporation of solvents, preparation of samples for further analysis.
<b>Technical characteristics</b>	Temperature range: 5 - 200° C Temperature stability: $\pm 0.15$ at 100 ° C Nominal heating power at 240 V: 650 W Power supply: 115/230V 50Hz Timer: 1 minute to 99 hours, 59 minutes Rack dimensions: 295 x 240 x 530 mm Dri Block dimensions: 279 x 260 x 105 mm
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>





<b>Device</b>	<b>Dryer</b>
<b>Model</b>	VSMD 53, Vims Elektrik
<b>Picture</b>	
<b>Application</b>	Samples drying and preparation for further analysis.
<b>Technical characteristics</b>	<p>Operating volume: 53 L Compartment dimensions: 400 x 400 x 330 mm Heater power: 1000 W Operating voltage: - 230 V (<math>\pm</math> 10 %) at 50 Hz Thermoregulation (temperature control) Microprocessor digital temperature controller PID controller with LED display for setting and reading teperature Temperature setting range: -5° C from ambient to 150° C Timer: setting the operating time 0 - 100 h</p>
<b>Contact</b>	Associate professor Aleksandra Marjanović, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:aleksandra.marjanovic@ffsa.unsa.ba">aleksandra.marjanovic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Water bath</b>
<b>Model</b>	WKP 35, Vims Elektrik
<b>Picture</b>	
<b>Application</b>	It provides chemical reactions at constant and elevated temperature.
<b>Technical characteristics</b>	<p>Dimensions: 600 x 400 x 350 mm Compartment: 500 x 300 x 200 mm Heater power: 2400 W Temperature: 99 ° C Volume: 35 L Precision: microprocessor control, digital, with and without timer (1 min-999 h) Raised lid that prevents dripping of condensate into the content of thermostated vessel. Flat lid with different number of openings – concentric rings. Test tube holders - rack</p>
<b>Contact</b>	Associate professor Aleksandra Marjanović, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:aleksandra.marjanovic@ffsa.unsa.ba">aleksandra.marjanovic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Centrifuge</b>
<b>Model</b>	IEC CL 10, Thermo SCIENTIFIC
<b>Picture</b>	
<b>Application</b>	It is used to separate the solid from the liquid phase. Also it separates particles that are in the same phase and differ in mass or density.
<b>Technical characteristics</b>	<p>Maximum capacity: 4 x 135 ml  Maximum density: 1200 kg/m<sup>3</sup>  Maximum load: 0.648 kg  Maximum speed: 6500 rpm  Control system: microprocessor  <b>Speed adjustment/ Display:</b>  Range: 300 – 6500 rpm  Speed change in one step: 10 rpm  Accuracy: ± 20 rpm  Timer: 1 – 99 min  Power: 150 W  Volume: 57 dBa</p>
<b>Contact</b>	Associate professor Aleksandra Marjanović, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:aleksandra.marjanovic@ffsa.unsa.ba">aleksandra.marjanovic@ffsa.unsa.ba</a>

<b>Device</b>	<b>Digital shaker</b>
<b>Model</b>	Wise Shake SHO – 2D
<b>Picture</b>	
<b>Application</b>	It is used for dissolving substances and homogenizing solutions.
<b>Technical characteristics</b>	Dimensions: 400 x 480 x 160 mm Base platform size: 350 x 350 mm Maximum load: 10 kg Rotation amplitudes: 20, 30 and 40 mm Speed: 10 – 300 rpm Display: digital LCD display (Timer, RPM and Power bar – graph) Weight: 20 kg
<b>Contact</b>	Associate professor Aleksandra Marjanović, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:aleksandra.marjanovic@ffsa.unsa.ba">aleksandra.marjanovic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Vacuum pump</b>
<b>Model</b>	KNF N026.3AN.18, Neuberger
<b>Picture</b>	
<b>Application</b>	It is used to induce and control solvent evaporation by reducing vapor pressure.
<b>Technical characteristics</b>	Delivery rate at atmospheric pressure: 20 L/min Maximum pressure: 2.5 bar g Vacuum: 100 mbar abs. Voltage/ Frequency: 230 V / 50 Hz Power: 100 W Operating current: 0.7 A Ambient temperature: 5 – 40 ° C
<b>Contact</b>	Associate professor Aleksandra Marjanović, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:aleksandra.marjanovic@ffsa.unsa.ba">aleksandra.marjanovic@ffsa.unsa.ba</a>


<b>Device</b>	<b>pH meter</b>
<b>Model</b>	Seven Easy S20, Mettler Toledo
<b>Picture</b>	
<b>Application</b>	pH measurement
<b>Technical characteristics</b>	pH range: 0.000 – 14.000 Accuracy: $\pm 0.004$ mV: -1.999 - 1.999 Temperature: -5.0 - 105.0 °C Dimensions: 180 x 180 x 65 mm Weight: 610 g
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>ELISA reader</b>
<b>Model</b>	Asys Expert Plus, Microplate Reader
<b>Picture</b>	
<b>Application</b>	ELISA microtiter plates reader is used for automatic reading of the absorbance of solution in polystyrene microtiter plates coated with antibody or antigen. It is used to determine concentrations of antibody and antigen in samples.
<b>Technical characteristics</b>	<p>Speed: 5 s for 96 microplates at one wavelength  Light source: 50 W Tungsten halogen lamp  Detection system: 8 silicone measuring diodes  Measurement system: 8-channel optical system with automatic calibration  Measurement range: 0,000 OD to 4,000 OD  Accuracy: <math>\pm 1\%</math> to 2.5 OD  Reproducibility and accuracy: <math>\pm 0.5\%</math> to 2.5 OD  Filters: 405, 450, 492, 620 nm (and 340 nm for UV version)  Voltage: 90 - 250 V, 50.60 Hz, 80 VA  Dimensions: 27 x 43 x 24 cm  Weight: 12 kg</p>
<b>Contact</b>	Associate professor Aleksandra Marjanović, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:aleksandra.marjanovic@ffsa.unsa.ba">aleksandra.marjanovic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Liquid chromatograph (HPLC)</b>
<b>Model</b>	Shimadzu HPLC sistem, VP class
<b>Picture</b>	
<b>Application</b>	<p>Liquid chromatography is a separation method based on the difference in the distribution of different components of the liquid mixture between mobile (liquid) phase, and stationary (solid or liquid) phase contained in a column. The mobile phase is pumped through column under the high pressure. The components of the mixture are separated based on the mechanisms of adsorption, different solubility, ion exchange, size and mass distribution, or stereochemical interaction. It is used for separation, qualitative and quantitative analysis of different substances. Identification is performed by comparison of retention times between samples and standards.</p>
<b>Technical characteristics</b>	<p>Controller system: SCL-10A  Pump: LC-10AT  Column section: CTO-10AC  Detector: SPD-M10A, RF-10A XL  Solenoid valves: FCV-10AL  Autosampler: SIL-10AD</p>
<b>Contact</b>	<p>Associate professor Ervina Bečić, PhD, MPharm  Department of Pharmaceutical Analysis  <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a></p>





<b>Device</b>	<b>Liquid chromatograph (HPLC)</b>
<b>Model</b>	Shimadzu HPLC sistem, VP class
<b>Picture</b>	
<b>Application</b>	<p>Liquid chromatography is a separation method based on the difference in the distribution of different components of the liquid mixture between mobile (liquid) phase, and stationary (solid or liquid) phase contained in a column. The mobile phase is pumped through column under the high pressure. The components of the mixture are separated based on the mechanisms of adsorption, different solubility, ion exchange, size and mass distribution, or stereochemical interaction. It is used for separation, qualitative and quantitative analysis of different substances. Identification is performed by comparison of retention times between samples and standards.</p>
<b>Technical characteristics</b>	<p>Degaser: DGU-20A5  Pump: LC-10AD  Column section: CTO-10AC  Detector: SPD-10AV  Autosampler: SIL-10AD</p>
<b>Contact</b>	<p>Associate professor Aleksandra Marjanović, PhD, MPharm  Department of Pharmaceutical Analysis  <a href="mailto:aleksandra.marjanovic@ffsa.unsa.ba">aleksandra.marjanovic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Gas chromatograph (GC) with thermal conductivity detector and electron capture detector</b>
<b>Model</b>	7890A, Agilent Technologies
<b>Picture</b>	
<b>Application</b>	<p>Gas chromatography is a separation method based on a different distribution of the components between the stationary (solid or liquid) and mobile phases (carrier gas). Thermal conductivity detector (TCD) measures the changes in thermal conductivity of carrier gas, measured current signal is proportional to the concentration of the component in carrier gas. Electron capture detector (ECD) measures the reduction of current signal proportional to the concentration of the component which captures the electron, caused by ionization of the carrier gas by radioactive radiation beams. It is used for identification and quantification of gas samples and thermostable organic compounds.</p>
<b>Technical characteristics</b>	<p>Retention time repeatability: &lt; 0.008% or &lt; 0.0008 min  Injector: 7683B  Dimensions: 28 × 31 × 16 cm  Ambient temperature: 4 °C to 450 °C  Maximum analysis: 999.99 min (16.7 h)  Basic components are gas carrier in a bottle, regulators of the gas flow rate, injector, thermostat, column, TCD detector, ECD detector.</p>
<b>Contact</b>	<p>Associate professor Aleksandra Marjanović, PhD, MPharm  Department of Pharmaceutical Analysis  <a href="mailto:aleksandra.marjanovic@ffsa.unsa.ba">aleksandra.marjanovic@ffsa.unsa.ba</a></p>

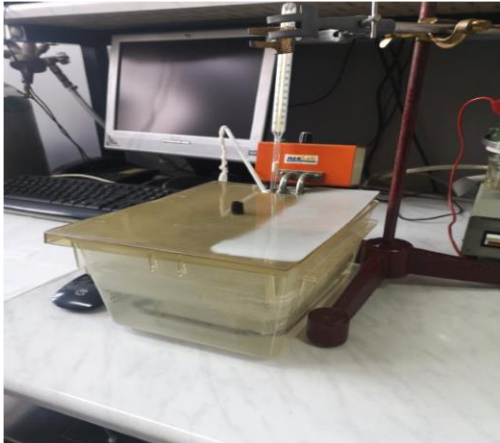
<b>Device</b>	<b>UV Lamp</b>
<b>Model</b>	74527, DESAGA Heidelberg
<b>Picture</b>	
<b>Application</b>	It is used to visualize samples applied to TLC plates. The visualization is performed at 254 nm and 356 nm.
<b>Technical characteristics</b>	V: 220 W: 60 Nr: 74527 UV/VIS: 254/366 nm
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>

<b>Device</b>	<b>Dryer</b>
<b>Model</b>	Sutjeska
<b>Picture</b>	
<b>Application</b>	Drying and preparation of laboratory equipment
<b>Technical characteristics</b>	$T_{\max}$ : 200 °C
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Ultrasonic bath</b>
<b>Model</b>	NE 1-4, Clifton
<b>Picture</b>	
<b>Application</b>	Dissolution of substances, homogenization of solutions by heating.
<b>Technical characteristics</b>	Capacity: 4 L Sensitivity: $\pm 0.25$ °C Uniformity: $\pm 0.1$ °C Temperature range: 5 – 100 °C
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Magnetic stirrer</b>
<b>Model</b>	42071, TMA CE
<b>Picture</b>	
<b>Application</b>	Dissolution of substances. This device uses rotating magnetic field to cause stirring and homogenize the solution.
<b>Technical characteristics</b>	Dimensions: 150 x 150 x 100 mm Speed: 80 – 1600 rpm Weight: 2.5 kg Voltage: 230 V Frequency: 50 Hz Heating plate diameter: 130 mm Temperature range: 0 – 300 °C
<b>Contact</b>	Associate professor Ervina Bečić, PhD, MPharm Department of Pharmaceutical Analysis <a href="mailto:ervina.becic@ffsa.unsa.ba">ervina.becic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Conductometer</b>
<b>Model</b>	HI 8733
<b>Picture</b>	
<b>Application</b>	Measuring electrical conductivity in solutions
<b>Technical characteristics</b>	<p>Measuring range: 0.0 – 199.9 <math>\mu\text{S}/\text{cm}</math>  Resolution: 0.1/1 <math>\mu\text{S}/\text{cm}</math>  Accuracy: 1%  Dimensions: 185 x 82 x 45 mm  Weight: 355 g  Battery life: 100 h  Ambient temperature: 0 – 50 °C</p>
<b>Contact</b>	<p>Associate professor Šaćira Mandal, PhD  Department of Natural Sciences and Mathematics in Pharmacy  <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Thermostat</b>
<b>Model</b>	WBS Fried Electric, P.O.B. 25169 - Haifa
<b>Picture</b>	
<b>Application</b>	Maintaining the temperature in the range of 10 – 110 °C
<b>Technical characteristics</b>	Temperature range: 10 – 110 °C Capacity: 4.3 L
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>





<b>Device</b>	<b>Thermostat</b>
<b>Model</b>	M 100, HAAKE, Boehringer Ingelheim Diagnostika
<b>Picture</b>	
<b>Application</b>	Maintaining the temperature in the range of -30 – 110 °C
<b>Technical characteristics</b>	Temperature range: -30 – 100 °C Capacity: 10 L S/N 8509195 AMP: 315 mAT V: 220 ± 10 % Hz: 50/60
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>


<b>Device</b>	<b>pH meter</b>
<b>Model</b>	HI8314, Hanna Instruments
<b>Picture</b>	
<b>Application</b>	pH measurement
<b>Technical characteristics</b>	<p>pH range: 0.00 – 14.00  ORP: + or – 1999 mV  Temperature range: 0.0 – 100.0 °C  pH resolution: 0.01  ORP resolution: 1 mV  Temperature resolution: 0.1 °C  pH accuracy: ± 0.01  ORP accuracy: ± 1mV  ATC range: 0 – 70 °C  Dimensions: 145 x 80 x 36 mm  Weight: 230 g</p>
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>


<b>Device</b>	<b>Magnetic stirrer</b>
<b>Model</b>	Magnetmix 2070
<b>Picture</b>	
<b>Application</b>	Dissolution of substances. This device uses rotating magnetic field to cause stirring and homogenize the solution.
<b>Technical characteristics</b>	Speed: 60 – 1600 rpm Power: 50 W Frequency: 50 Hz
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>

<b>Device</b>	<b>UV lamp</b>
<b>Model</b>	UVLS-24
<b>Picture</b>	
<b>Application</b>	It is used in the identification of bacteria, optical measurements, fluorescence, TLC identification and in biochemical testing.
<b>Technical characteristics</b>	Dimensions: 249 x 97 mm Wavelength: 254 nm, 365 nm Lighting type: Handheld lamp Voltage: 115 V Amperage: 0.16 A
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>


<b>Device</b>	<b>Vacuum pump</b>
<b>Model</b>	KNF N022 AN18
<b>Picture</b>	
<b>Application</b>	It is used to induce and control solvent evaporation by reducing vapor pressure.
<b>Technical characteristics</b>	Maximum flow rate at atmospheric pressure: 15 L/h Maximum pressure: 4 bar Vacuum: 100 mbar Voltage/ Frequency: 240 V / 50 Hz Power: 80 W Dimensions: 194 x 203 x 103 mm Weight: 4 kg
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>


<b>Device</b>	<b>Vacuum pump</b>
<b>Model</b>	KNF N026.3AN.18, Neuberger
<b>Picture</b>	
<b>Application</b>	It is used to induce and control solvent evaporation by reducing vapor pressure.
<b>Technical characteristics</b>	Delivery at atmospheric pressure: 20 L/min Maximum pressure: 2.5 bar g Vacuum: 100 mbar abs. Voltage/ Frequency: 230 V / 50 Hz Power: 100 W Operating current: 0.7 A Ambient temperature: 5 – 40 ° C
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>


<b>Device</b>	<b>Vacuum pump</b>
<b>Model</b>	KNF D-79112 Freiburg, N022 AT.18
<b>Picture</b>	
<b>Application</b>	It is used to induce and control solvent evaporation by reducing vapor pressure.
<b>Technical characteristics</b>	Maximum flow rate at atmospheric pressure: 13 L/min Maximum pressure: 4 bar g Vacuum: 100 mbar Voltage/ Frequency: 100 V / 50/60 Hz Power: 140 W
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>


<b>Device</b>	pH meter
<b>Model</b>	Inolab, 720 wtw
<b>Picture</b>	
<b>Application</b>	pH measurement
<b>Technical characteristics</b>	Dimensions: 230 x 210 x 70 mm Weight: 850 g Storage temperature: -25 - +65 ° C Operating temperature: 0 - 55 ° C Maximum relative humidity: <75 % pH range: -2 - +16 pH accuracy: ± 0.01
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>





<b>Device</b>	<b>Handheld spectrophotometer</b>
<b>Model</b>	Spectro 2, Riedel de Haen
<b>Picture</b>	
<b>Application</b>	It is used for quantitative analysis of solutions and identification of compounds containing chromophores. This method applies to the determination of components in multicomponent mixtures. It analyzes the inorganic and organic compounds dissolved in water and organic solvents, pharmaceutical products, extracts of plant drugs, food samples and biological samples.
<b>Technical characteristics</b>	Wavelengths: 480/565/585/635 nm Accuracy: electro – optical 1% ± 2 units in the range of 0.100 - 1,000 extinction Cuvettes: 16 mm round cuvettes
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>


<b>Device</b>	<b>Annealing furnace</b>
<b>Model</b>	Nabertherm L 1/12/R6
<b>Picture</b>	
<b>Application</b>	Annealing of samples
<b>Technical characteristics</b>	Control type: digital Frequency: 50/60 Capacity: 1 L Chamber depth: 11.4 cm Maximum temperature: 1200 ° C
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>


<b>Device</b>	<b>Analytical balance</b>
<b>Model</b>	Sartorius
<b>Picture</b>	 A Sartorius analytical balance is shown, featuring a stainless steel base and a clear glass draft shield. The weighing pan is visible inside the shield, and a small amount of brown powder is being weighed. The digital display on the front shows a reading of 0.0000 g.
<b>Application</b>	Weighing small amounts of sample
<b>Technical characteristics</b>	Readability: 0.01 mg Maximum capacity: 210 g Linearity: (0.03)/0.1/0.2 mg
<b>Contact</b>	Associate professor Šaćira Mandal, PhD Department of Natural Sciences and Mathematics in Pharmacy <a href="mailto:sacira.mandal@ffsa.unsa.ba">sacira.mandal@ffsa.unsa.ba</a>

<b>Device</b>	<b>UV-1601 Spectrophotometer</b>
<b>Model</b>	Shimadzu UV-1601/ Cat.No. 206-67001-34
<b>Picture</b>	
<b>Application</b>	Spectrophotometric determination of unknown concentration of analyte solutions based on light absorption in the visible or UV part of the spectrum. Existing configuration methods also include measuring the concentration and ratio of nucleic acids and proteins.
<b>Technical characteristics</b>	External dimensions: 450 x 590 x 430 mm Wavelength range: 190-1100 nm 50W halogen lamp Detector: Silicone photodiode Photometric modes: Abs, T%, E
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>


<b>Device</b>	<b>HPLC</b>
<b>Model</b>	Shimadzu SIL – 10AD VP
<b>Picture</b>	
<b>Application</b>	A chromatographic method used to separate mixtures, in which the ingredients to be separated are distributed between two phases. The two phases by which the ingredients are separated in chromatography are: the stationary or stationary phase and the mobile or mobile phase.
<b>Technical characteristics</b>	Volts: 230 HZ. 50/60
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Dissolution tester</b>
<b>Model</b>	ERWEKA DT GmbH/ No.60838
<b>Picture</b>	
<b>Application</b>	The dissolution tester is used to test the release of the active principle from the pharmaceutical form. Basically, the dissolution test is an analysis of the concentration of active ingredients of solid oral forms in a solution released in a certain period of time with reference substances or standards of active ingredients for that product.
<b>Technical characteristics</b>	USP methods 1 (basket apparatus) and 2 (blade apparatus) Sample vessel capacity 1000 mL 1 sample container
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Disintegration apparatus</b>
<b>Model</b>	ERWEKA ZT3
<b>Picture</b>	 <p>The image shows the ERWEKA ZT3 disintegration apparatus. It consists of a base unit with a control panel on the left featuring a digital display, several buttons (green, red, yellow, black), and a power switch. On the right side of the base is a motor unit with a dial and a green power button. A transparent acrylic container is mounted on top of the base, containing a test unit with six cylindrical specimens held in place by a net. The entire setup is designed for visual monitoring of tablet disintegration in a liquid medium.</p>
<b>Application</b>	The apparatus is used for testing the disintegration of tablets (disintegration of tablets implies their disintegration into smaller granules or particles in a suitable medium). Water heated to 37°C is used as the most common medium, while other media simulating the conditions prevailing in the gastrointestinal tract (pepsin, hydrochloric acid, peristalsis and body temperature 37°C) can be used until the tablets completely disintegrate in the medium.
<b>Technical characteristics</b>	<ul style="list-style-type: none"> <li>-the test unit has six places for placing cylindrical specimens at the bottom of which there is a net</li> <li>-one unit is in a separate container (volume 1000 mL) which is immersed in a thermostated water bath made of resistant acrylic glass so that the whole process can be monitored visually</li> </ul>
<b>Contact</b>	<p>Assistant professor Ognjenka Rahić, PhD, MPharm  Department of Pharmaceutical Technology  <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a></p>


<b>Device</b>	<b>Vibrating sieve</b>
<b>Model</b>	ERWEKA VT/VS
<b>Picture</b>	 A photograph of an ERWEKA VT/VS vibrating sieve. The device consists of a stainless steel cylindrical sieving chamber mounted on a yellow base. The base has a control panel with a digital display, several buttons (red, green, yellow), and a power switch. The brand name 'ERWEKA' is visible on the base. The device is placed on a dark surface against a light-colored tiled wall.
<b>Application</b>	The vibrating sieve is used for automated sieving of materials of different particle sizes, by vibrating rotation of the housing of the apparatus (principle of horizontal shaking). The use of a series of sieves with different opening sizes enables precise determination of particle size distribution, as well as fractionation of a certain particle size of material and particle size quantification, the results of which can play an important role in ensuring the success of subsequent operations. Wet dry granules and other substances and excipients can be sieved.
<b>Technical characteristics</b>	-series of standard sieves, size 0.25-12 mm -manual adjustment of sieve duration and vibration intensity
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>





<b>Device</b>	<b>Planetary mixer</b>
<b>Model</b>	ERWEKA/PRS
<b>Picture</b>	
<b>Application</b>	The planetary mixer is used to mix viscous liquids, ointments, creams, pastes, and liquids and powders. The mixing element moves around the axis of the vessel and around its axis, so that the mixer comes into contact with the entire mass of liquid, causing intensive mixing of viscous liquids and fats.
<b>Technical characteristics</b>	<ul style="list-style-type: none"><li>-connect to drive unit type AR400 by screwing all 4 brackets</li><li>- 2 mixing bowls made of stainless steel with a volume of 5L</li><li>-stainless steel mixing attachments: whisk (liquid mixing), mixing paddle mixing mixer (mixing powders and greases),</li><li>-shoe blade Teflon cleaning (scraping)</li></ul>
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>

<b>Device</b>	<b>Cube mixer</b>
<b>Model</b>	ERWEKA/KB 15-UG
<b>Picture</b>	
<b>Application</b>	The mixer cube is used to mix solid materials (powders). It works on the principle of overturning solid material in order to mix and homogenize the mixture. Mixing is very gentle and the apparatus is suitable for dependently sensitive materials.
<b>Technical characteristics</b>	<ul style="list-style-type: none"> <li>-Connect to ERWEKA drive unit type AR 400</li> <li>- a plexiglass container in the shape of a cube with a volume of 3.5 L</li> <li>-three stainless steel bars that are positioned inside the cube and aid mixing</li> <li>-maximum sample capacity 1.5 kg</li> <li>- the hand lever allows setting the angle of the mixing bowl between 0° and 45°</li> <li>-manual speed adjustment</li> </ul>
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Apparatus for determining the firmness of tablets</b>
<b>Model</b>	ERWEKA/TB 24
<b>Picture</b>	
<b>Application</b>	The device is used to test the strength of tablets, which directly depends on the pressure during tableting, the type of binders, the method of preparation of granules, the moisture content of granules, the properties of the compressed substance and the shape of tablets. completely destroy. When the tablet breaks, the motor is stopped by the micro-device, and the hand, connected by the micro-device, shows the exact value of the pressure at the moment of fracture.
<b>Technical characteristics</b>	-2 test inserts (a test insert with a smaller groove is used to test tablets up to 10 mm in diameter, and another with a test groove for testing tablets larger than 10 mm in diameter) -maximum force 150 N
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>

<b>Device</b>	<b>Apparatus for molding suppositories and lipsticks</b>
<b>Model</b>	ERWEKA/SG III W
<b>Picture</b>	
<b>Application</b>	This apparatus is designed for the production of suppositories, lipsticks and similar products. Mixing and heating are achieved in one operation and are not interrupted during the filling process. The molds to be filled are placed on a platform under the dispensing nozzle. The handwheel allows the operator to move the platform and thus the mold in both axes.
<b>Technical characteristics</b>	<ul style="list-style-type: none"> <li>-mixing bowl (volume 5 L, working capacity max. 65%)</li> <li>-oil bath with thermostatically controlled heater (temperature can be adjusted in the range from 20 °C to 100°C).</li> </ul>
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Friability tester</b>
<b>Model</b>	ERWEKA/TA
<b>Picture</b>	
<b>Application</b>	The apparatus is used to determine the wear of tablets. Tablet wear is tested on compressed, uncoated tablets. Consumption is defined as the percentage of weight loss of tablets relative to mechanical action during testing.
<b>Technical characteristics</b>	<ul style="list-style-type: none"><li>-the appliance consists of a drum, a motor and a built-in time clock</li><li>-the drum is made of plexiglass, 20 cm in diameter</li><li>-speed speed 20 rpm</li><li>- blades are built into the drum which, when the drum rotates, raise the tablets to a certain height, and then lower them without hitting each other.</li></ul>
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>


<b>Device</b>	<b>High speed mixer granulators</b>
<b>Model</b>	ERWEKA/SW1 GmbH/ No.64391
<b>Picture</b>	
<b>Application</b>	The high speed mixer granulator is used for mixing liquids and powders / granulation.
<b>Technical characteristics</b>	<ul style="list-style-type: none"><li>-device with stationary mixing chamber</li><li>-slower sharp mixer or scraper - mixes material and eliminates blind spots,</li><li>-fast mixer - chopper - mixes the material in more detail and homogenizes it</li><li>-the chopper is placed sideways in the bowl and rotates independently of the other elements of the mixer</li></ul>
<b>Contact</b>	Assistant professor Ognjenka Rahić, PhD, MPharm Department of Pharmaceutical Technology <a href="mailto:ognjenka.rahic@ffsa.unsa.ba">ognjenka.rahic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Rotavapor</b>
<b>Model</b>	IKA, RV 10 D S99
<b>Picture</b>	
<b>Application</b>	Evaporation of liquid samples
<b>Technical characteristics</b>	Rotation speed: 20 - 280 rpm Water / oil bath: 20 - 180 ° C
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Vacuum pump</b>
<b>Model</b>	KNF Neuberger, N816.3KT.18
<b>Picture</b>	
<b>Application</b>	It is used to induce and control solvent evaporation by reducing vapor pressure
<b>Technical characteristics</b>	$P_{\max}$ : 0,5 bar n: 3000 rpm Hz: 50 W: 100 Motortype: M37
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>





<b>Device</b>	<b>Vacuum pump</b>
<b>Model</b>	KNF Neuberger, N820.3FT.40.18
<b>Picture</b>	
<b>Application</b>	It is used to induce and control solvent evaporation by reducing vapor pressure
<b>Technical characteristics</b>	$P_{\max}$ : 1 bar n: 3000 rpm Hz: 50 kW: 0,120 Motortype: I56
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>


<b>Device</b> <b>Device</b>	<b>Dryer</b> <b>Water bath</b>
<b>Model</b>	Witeg, WB-22
<b>Picture</b> <b>Picture</b>	
<b>Application</b>	It enables chemical reactions to take place at a constant and elevated temperature.
<b>Technical characteristics</b> <b>Technical characteristics</b>	$T_{\max}$ : 220 °C Dimensions: 535 x 330 x 260 mm Working space: 500 x 295 x 150 mm Heater power: 2 kW
<b>Contact</b>	Temperature: 100 ° C Volume: 22 L Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>


<b>Device</b>	<b>Digital shaker</b>
<b>Model</b>	Heidolph, Promax 1020
<b>Picture</b>	 A digital shaker machine, model Heidolph Promax 1020, is shown. It has a light blue base with a black control panel on the front. The panel features a digital display showing '120', several buttons, and a large red rotary knob. On top of the machine, there is a glass flask containing a liquid, secured with a clamp and a black handle. The machine is designed for laboratory use to shake and mix samples.
<b>Application</b>	It is used for dissolving substances and homogenizing solutions.
<b>Technical characteristics</b>	Dimensions: 320 x 375 x 125mm Base platform size: 290 x 258 mm Maximum load: 5 kg Rotation amplitudes: 32 mm Speed: 20 - 250 rpm
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>

<b>Device</b>	<b>pH meter</b>
<b>Model</b>	SevenEasy pH, Mettler Toledo
<b>Picture</b>	
<b>Application</b>	pH value measurement
<b>Technical characteristics</b>	Measurement range: 0.000 - 14.000 Accuracy: $\pm 0.004$ mV: -1,999 - 1,999 Temperature: -5.0 - 105.0 ° C Dimensions: 180 x 180 x 65 mm Weight: 610 g
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>


<b>Device</b>	<b>UV Lamp with cabinet</b>
<b>Model</b>	Vilber, VL-6.C, CN-6
<b>Picture</b>	
<b>Application</b>	It is used to visualize samples applied to TLC plates. The observation is performed at 254 nm.
<b>Technical characteristics</b>	Wavelength [nm]: 254 Filter size [mm]: 145 x 48 Power [W]: 1 x 6  Cabinet: External dimensions: 30 x 28 x 24 cm
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>

<b>Device</b>	<b>Magnetic stirrer</b>
<b>Model</b>	Witeg, WiseStir MSH-20D
<b>Picture</b>	
<b>Application</b>	Dissolution of substances and homogenization of the solution by stirring on the principle of a rotating magnetic field.
<b>Technical characteristics</b>	Heating plate dimensions: 180 x 180 mm Speed: 80 - 1500 rpm Capacity: 20 L Voltage: 230 V Frequency: 50/60 Hz Temperature range: 0 - 380 ° C
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>

<b>Device</b>	<b>Analytical balance</b>
<b>Model</b>	OHAUS Pioneer, PA2102
<b>Picture</b>	 A photograph of an OHAUS Pioneer PA2102 analytical balance. The device is white with a stainless steel weighing pan on top. The front panel features a digital display showing '0.00 g' and several control buttons including 'Unit', 'Mode', 'On/Off', 'Print', and 'Zero'. The OHAUS logo is visible on the left side of the front panel. A large watermark 'INDOGAMA.COM' is overlaid on the image.
<b>Application</b>	Weighing samples
<b>Technical characteristics</b>	Readability: 0.01 g Maximum capacity: 2100 g Linearity: $\pm 20$ mct Plate diameter: 18 cm
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>

<b>Device</b>	<b>Apparatus for determining the melting temperature</b>
<b>Model</b>	Krüss Optronic, KSP I D
<b>Picture</b>	
<b>Application</b>	Determination of melting temperature in glass capillaries
<b>Technical characteristics</b>	Measuring range: 30–360 ° C Accuracy: $\pm 0.3$ ° C (30–200 ° C) $\pm 0.5$ ° C (200–360 ° C) Resolution: 0.1 ° C Warm-up speed: 1 ° C per minute Capillary $\varnothing$ : 1.4 mm Dimensions (w x h x d): 230 mm x 320 mm x 210 mm Weight: 2.3 kg
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>



<b>Device</b>	<b>Kofler apparatus for determining the melting temperature</b>
<b>Model</b>	Reichert Austria, Kofler aparat
<b>Picture</b>	
<b>Application</b>	Determination of melting temperature
<b>Technical characteristics</b>	Measuring range: 50–350 ° C
<b>Contact</b>	Full professor Samija Muratović, PhD, MPharm Department of Pharmaceutical Chemistry <a href="mailto:samija.muratovic@ffsa.unsa.ba">samija.muratovic@ffsa.unsa.ba</a>