**Перечень оборудования лаборатории**

**1. Name of scientific laboratory** A-539

2. **Objectives of the scientific laboratory**: research within the framework of the project “Metal-organic coordination polymers based on azoles: synthesis, study of properties, production of new functional materials” state budgetary research No. 327/2 dated November 27, 2020, leader Kasanova A.Zh.

**List of laboratory equipment**

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| **№** | **Name of the equipment** | **Brief characteristics of the equipment** | **Tasks performed on the equipment** | **Year of manufacture** | **Certification (yes/no)** | **Date of equipment verification** | **Notes** |
| 1 | Vacuum ceramic evaporator | Evaporation volume, ml 50-3000  Rotation speed, rpm 20-240  Manual speed adjustment  Maximum tilt angle of the refrigerator 60°  Engine power, W 40  Condenser - diagonal Heating bath:  5 liter bathtub with Teflon coating;  LCD display showing current and set temperatures;  Possibility of using water or oil as a coolant;  Maximum heating temperature – 100°С (for water), 180°С (for oil);  Heating power, W 1300  Bath volume, 5 l | used for high-quality and simple distillation and evaporation of solvents and separation of liquid media from a spinner flask at reduced atmospheric pressure | 2019 | no | - |  |
| 2 | Laboratory rotary evaporator with vacuum pump | Water Vacuum Pump Cycly  Flow (l/min): 60 lift (m): 8  Power (W): 180 extracted gas capacity per tap (l/min): 10  Water storage capacity (L): 15 degrees vacuum (MPa): -0.098  Power supply (V/Hz): 220V, 50Hz taps: double (optional: four vacuum meters and taps)  Anti-corrosion material Capacitors and rotating bulb: 3.3 borosilicate glass with high chemical resistance  Integrated control panel displaying temperature, rotation speed and bath height.  LCD display. | used for high-quality and simple distillation and evaporation of solvents and separations of liquid media from a rotating flask at reduced atmospheric pressure | 2019 | no | - |  |
| 3 | Magnetic stirrer with ceramic heating plate C-MAG HS 7 Control | Mixing stations 1  Max. Volume (H2O) 10 l  Speed range control Scale 0-6  Torque range 100 - 1500 rpm  Max. length of magnetic stirrer 80 mm  Heating power 1000 W  Heating temperature range 50-500 °C  Heating rate 5K/min | designed for long-term mixing of liquid with heating to the required temperature, during long-term syntheses and when preparing solutions for dissolving reagents. Temperature and speed are adjustable. | 2020 | no | - |  |
| 4 | Combined laboratory refrigerator Pozis HL-340 | Total volume, l 400  Refrigerator compartment volume, l 270  Useful volume of the refrigerator compartment, l 199  Temperature in the refrigerator compartment +2….+15°С  Refrigerator door metal  Freezer volume, l 130  Useful volume of the freezer compartment, l 88  Temperature in the freezer -10....-25°C  Metal freezer door  Number of compressors, pcs. 2  Voltage, V 220  Frequency, Hz 50  Electricity consumption, kWh/day 1.84  Refrigerant R600a | A two-chamber laboratory refrigerator with a freezer compartment with a capacity of 400 liters is designed for storing reagents, experimental samples, etc. at temperatures from +2°C to +15°C and from -10°C to -25°C. | 2020 | no | - |  |
| 5 | Portable ultraviolet lamp Vilber Lourmat | number of lamps x lamp power, W – 2×6;  radiation wavelength, nm - 365 / 254;  intensity at a distance of 15 cm 365 nm, μW/cm2 - 610;  intensity at a distance of 15 cm 254 nm, μW/cm2 - 400;  dimensions, mm - 276×85×60. | For disinfection and disinfection of premises from viruses and bacteria | 2020 | no | - |  |
| 6 | Dish drying device PE-2010 | Supply voltage 220±20 V  Power consumption - no more than 1500 W;  Maximum continuous operation time - 8 hours;  Overall dimensions - 550x281x515 mm  Number of pins: 26 pcs. (d=12 mm) + 13 pcs. (d=6.5 mm) | Designed for simultaneous drying of up to 26 units of large (flasks, glasses) and up to 13 units of small laboratory glassware (test tubes). | 2020 | no | - |  |
| 7 | Heated magnetic stirrer RST basic | Mixing stations 1  Max. Volume (H2O) 20 l  Drive power consumption 16 W  Produced drive power 9 W  Speed indicator LED line  Torque range 0/50 - 1500 rpm  Max. length of magnetic stirrer 80 mm  Heating power 600 W  Heating rate ((1 l H2O im H15) 6.5 K/min  Heating temperature range Ambient temperature environment - 310 °C  Adjustable safe heating min. 50°C  Adjustable safe heating max. 360°C  Connector for connecting an 8-pin thermometer PT1000  Heating plate material Aluminum alloy  Heating plate size Ø 135 mm | designed for long-term mixing of liquid with heating to the required temperature, during long-term syntheses and when preparing solutions for dissolving reagents. Temperature and speed are adjustable. | 2020 | no | - |  |
| 8 | Analytical Laboratory balance AS 220.R2 | The largest weighing limit is 220 g,  the smallest weighing limit is 10 mg,  resolution 0.1 mg,  repeatability (RMS) 0.1 mg,  linearity ±2 mg,  stabilization time 3.5 s,  bowl size 100 mm,  operating temperature +10 - +40 degrees Celsius,  automatic calibration,  LCD display, interface 2×RS 232, USB-A, USB-B,  dimensions 495×400×515 mm, weight 5.4 kg. | designed for weighing samples of materials, reagents, etc. | 2022 | no | - |  |
| 9 | Diaphragm vacuum pump IKA MPV 10 basic | Max. Feed rate (50/60 Hz) 1.7 m³/h  Pump supply voltage (50/60 Hz) 28.3 l/min  Maximum pumping pressure without gas ballast 7 mbar  Maximum pumping pressure with gas ballast 15 mbar  Cylinder 2  Gas ballast valve yes  Inlet pressure 7 – 1050 mbar  Speed (50Hz) 1380 rpm  Speed (60Hz) 1680 rpm  Sound level at low pressure 65 dB(A)  Automatic mode yes  Manual mode yes  Pump mode % yes  Program mode yes  Dimensions 245 x 155 x 320 mm  Weight 11.5 kg  Permissible ambient temperature 10 – 40 °C  Permissible relative humidity 80%  Protection class according to DIN EN 60529 IP 54  Voltage 230 / 115 / 100 V  Frequency 50/60 Hz  Power consumption 180 W | designed to create a vacuum in sealed volumes and systems, as well as to remove or ensure a continuous flow of gases and their mixtures in technologies using low (sub-atmospheric) pressures. | 2022 | no | - |  |
| 10 | Ultrasonic bath PSB-Gals | Volume 2.8 l Operating frequency 28 kHz Power consumption 900 W Generator power 300 W Heater power 525 W Operating capacity 235x135x100 mm  (length - width - depth) | Ultrasonic baths are used in workshops, laboratories, and in production to clean parts, assemblies and products from various contaminants: coolants, fats, greases, oils, polishing and other pastes, paints, scale, water stone, etc.; obtaining stable emulsions from immiscible liquids; grinding (dispersing) solid and liquid particles; acceleration of chemical reactions; mixing and stirring. Operating frequencies: 22, 25, 28, 35 or 60 kHz. | 2022 | no | - |  |
| 11 | Magnetic stirrer with ceramic heating plate C-MAG HS 7 Control | Mixing stations 1  Max. Volume (H2O) 10 l  Speed range control Scale 0-6  Torque range 100 - 1500 rpm  Max. length of magnetic stirrer 80 mm  Heating power 1000 W  Heating temperature range 50-500 °C  Heating rate 5K/min | designed for long-term mixing of liquid with heating to the required temperature, during long-term syntheses and when preparing solutions for dissolving reagents. Temperature and speed are adjustable. | 2022 | no | - |  |
| 12 | Heated magnetic stirrer Stegler HS-Pro Digital | Mixing stations 1  Max. Volume (H2O) 20 l  Drive power consumption 16 W  Produced drive power 9 W  Speed indicator LED line  Torque range 0/50 - 1500 rpm  Max. length of magnetic stirrer 80 mm  Heating power 600 W  Heating rate ((1 l H2O im H15) 6.5 K/min  Heating temperature range Ambient temperature environment - 310 °C  Adjustable safe heating min. 50°C  Adjustable safe heating max. 360°C  Connector for connecting PT1000 contact thermometer  Heating plate material: Aluminum alloy  Heating plate size Ø 135 mm | designed for long-term mixing of liquid with heating to the required temperature, during long-term syntheses and when preparing solutions for dissolving reagents. Temperature and speed are adjustable. | 2022 | no | - |  |
| 13 | Heated magnetic stirrer RST basic | Mixing stations 1  Max. Volume (H2O) 20 l  Drive power consumption 16 W  Produced drive power 9 W  Speed indicator LED line  Torque range 0/50 - 1500 rpm  Max. length of magnetic stirrer 80 mm  Heating power 600 W  Heating rate ((1 l H2O im H15) 6.5 K/min  Heating temperature range Ambient temperature environment - 310 °C  Adjustable safe heating min. 50°C  Adjustable safe heating max. 360°C  Connector for connecting PT1000 contact thermometer  Heating plate material: Aluminum alloy  Heating plate size Ø 135 mm | designed for long-term mixing of liquid with heating to the required temperature, during long-term syntheses and when preparing solutions for dissolving reagents. Temperature and speed are adjustable. | 2022 | no | - |  |
| 14 | Electric water distiller DE-25M | Length, mm 460  Width, mm 382  Height, mm 685  Productivity, l/h 25  Case material polished stainless steel  Electric heaters (heating elements) stainless steel  There is an automatic control system  Power consumption, kW 15  Time to establish operating mode, min 30  Water consumption, l/h 350  Type of current three-phase alternating  Power supply, V\Hz 380\50 | for the production of distilled water. The DE-25 M water distiller is capable of producing both cold and hot water, | 2021 . | no | - |  |

**1. Responsible person: Kasanova A.Zh.**

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