



“ M i r c e a c e l B ă t r ă n ” N A V A L A C A D E M Y
FACULTY OF NAVIGATION AND NAVAL MANAGEMENT
DEPARTMENT OF NAVAL AND PORT ENGINEERING AND MANAGEMENT

CHEMISTRY LABORATORY

1. Destination

The laboratory ensures the development of practical activities in the discipline: Chemistry, for first year students, from all specializations of commercial navy, navy, naval and port management as well as students interested in participating in student communication sessions, to perform papers with topics from the field of protection of the marine environment.

Also, the laboratory equipment allows the performance of joint works with topics focused on the development of biomaterials with applications in environmental and medical engineering with master's or doctoral students from the Faculty of Applied Chemistry and Materials Science (Polytechnic University of Bucharest) and the Faculty of Pharmacy (University Ovidius Constanța), based on the concluded collaborations.

2. General objective

Acquiring the basic notions of modern chemistry and specific methods that have applications in navigation and transport engineering and that will allow graduates of higher technical marine education to carry out activities in the fields of applied chemistry (environmental protection, pollution).

3. Specific objectives

- ✓ the formation of the practical skills necessary in the control of water quality and its treatment, ensuring its appropriate quality indices and thus preventing crust deposits and corrosion in naval installations;

- ✓ mastering methods for determining the physico-chemical characteristics of petroleum products (calculation of the quantity of goods and calculation of the quantity of fuel), as well as performing rapid tests that determine when to replace used or dangerous products;
- ✓ developing the practical skills needed to treat the resulting waste on board ships, before discharging them into navigable waters, preventing pollution of these waters;
- ✓ mastering practical skills of working with test and analysis equipment, similar to those used on board ships;
- ✓ development of methods for extraction of local marine sources, in order to achieve biomaterials with medical applications and in environmental protection;
- ✓ obtaining a hydro-alcohol-glycerinate disinfectant (authorized), with virucidal and bactericidal action.

4. Facilities

- ⚓ video projector, projection screen, laptop with internet connection;
- ⚓ equipment specific to the general chemistry laboratory:
 - ⌚ Schilling burette, Schellbach line straight valve burette, Pellet automatic burette, burette pear, 3-valve pipette pear;
 - ⌚ Erlenmeyer glasses, Berzelius glasses, test tubes, graduated cylinders, rated balloons, watch bottles, spatulas, pads, graduated pipettes, Pasteur pipettes;
 - ⌚ thermometers, thermodensimeters (areometers);
 - ⌚ normal pressure filter funnels, Buchner filter funnels, separation and drip funnels,
 - ⌚ dryer, porcelain capsules and crucibles, crystallizers, Petri dishes, vacuum tube, stands, clamps, crucible pliers, curved-tipped and toothed-tipped tweezers, weighing ampoules, spoon spatulas, bottles and jars of reagents with ground-stopper, mortar with pestle;
- ⚓ paper laboratory accessories: qualitative and quantitative filter paper, pH indicator paper, parafilm;
- ⚓ Automatic micropipettes with variable volume (0-100 μL ; 100-1000 μL) micropipette tips;
- ⚓ Analytical balance, pharmaceutical balance, technical balance, weighing trays;
- ⚓ Specific reagents (bases, acids, acid-base indicators, etc.);
- ⚓ Ultrasonic heated bath;
- ⚓ Electric calcination sensor;
- ⚓ Laboratory oven with forced ventilation;
- ⚓ Electric hobs with stirring and temperature sensor, magnets and magnet extraction rod with Teflon coating;

- ⚓ Digital sand bath;
- ⚓ Heating nest 500 mL Nahita;
- ⚓ Centrifuge Z306, 4500 rpm, centrifuge tubes (PP) with lid;
- ⚓ Nahita microcentrifuge 4-6-10000 rpm, Eppendorf tubes;
- ⚓ Digital vortex mixer with IR sensor;
- ⚓ GFL distiller
- ⚓ Functional multiparameter 8603 (pH, conductivity, salinity, oxygen consumption);
- ⚓ SEITRON CHEMIST 500 (combustion gas analysis);
- ⚓ Portable mini-laboratory for water analysis AQUA-CHECK 2
- ⚓ GAS DETECTOR - ION SCIENCE (VOC analyzer);
- ⚓ Ceramic chemical niche, with cabinet for chemical reagents, with ventilation at the bottom.

5. Laboratory work performed

- 🏭 practical works on physico-chemical analyzes of water (pH, conductivity, salinity, total hardness and alkalinity);
- 🏭 practical work on the determination of the rheological characteristics of fuels and lubricants (density, viscosity),
- 🏭 practical electrochemical works (galvanic corrosion, cathodic protection with sacrificial anodes, determination of the electromotive force of the Daniell-Jacobi cell);
- 🏭 hygroscopicity, ash, bulk density analyzes on various materials, in powder form.
- 🏭 research papers on the extraction and study of chitosan from marine sources (crustaceans, mollusks) for the development of biomaterials.



