

Handout set of atom models

LABOTRIX ATOMIX A2

PRODUCT PASSPORT

Kyiv

2026

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1. General Information about the Product

- 1.1. **Product name** — Atom model set with rods (student handout).
- 1.2. **Trademark** — Labotrix.
- 1.3. **Model** — Atomix A2; full trade designation — LABOTRIX ATOMIX A2.
- 1.4. **Manufacturer** — Labotrix Group Limited, China.
- 1.5. **Intended use:** the kit is designed for the visual representation of the spatial structure of molecules of organic and inorganic substances in chemistry lessons in middle and high school. It helps students visualize the structure of molecules, understand the valency of atoms, the multiplicity of chemical bonds, and the phenomenon of isomerism. The set is designed for individual or group work by students.
- 1.6. **Design features:** each atomic ball has holes made at specified angles corresponding to the geometry of molecular structures. The coloring of the balls follows the international color-coding system for chemical elements, so the element is easy to identify in the assembled model. Atoms are connected with rigid and flexible rods: the former convey a single bond, the latter — a double or triple bond.

2. Technical Specifications

- Brand — Labotrix
- Model — Atomix A2
- SKU — LTX-ATOMIX-A2
- Product type — Atom model set with rods (student handout)
- Total number of parts (pcs) — 92
- Number of atom balls (pcs) — 52
- Number of connecting rods (pcs) — 37
- Diameter of the large balls (mm) — 23
- Diameter of the small balls (mm) — 17
- Length of the short rod for single bonds (mm) — 27
- Length of the long rod for double and triple bonds (mm) — 43
- Material of the balls — impact-resistant plastic
- Material of the rods — polymer
- Number of element types in the kit (pcs) — 6
- Power — not required
- Operating conditions — premises of an educational institution, air temperature from +5 to +40 °C, relative humidity from 40 to 60 % without condensate
- Language of marking and operating documentation — Ukrainian
- Documentation supplied — product passport with warranty card and operating manual
- Packaging — individual box of corrugated cardboard with the contents secured
- Care of the surfaces — wiping with a dry or slightly damp cloth is permitted
- Work organization — the kit is designed for the individual work of one student at a workstation
- User requirements — students assemble the models under the supervision of a chemistry teacher
- Service life (year) — 5

- Warranty period (month) — 12

3. Package Contents

- Atomic balls — 52 pcs
- Connecting rods — 37 pcs
- P-orbitals (petal-shaped parts) — 3 pcs
- Product Passport and Warranty Card — 1 pcs
- Individual transport packaging — 1 pcs

The kit does not require assembly before use. Beige universal balls with different hybridization types (sp^2 , sp^3 , dsp^3 , d^2sp^3) serve as substitutes for elements that are insufficient in the kit.

4. Safety Precautions

4.1. General requirements

- The kit is intended for middle and high school students under the supervision of a chemistry teacher.
- The kit is not intended for children under 36 months — it contains small parts that can be swallowed.
- Before first use, read this passport and keep it together with the product.
- Do not put the parts in your mouth and do not allow them to be swallowed.
- Inspect the unpacked kit to detect mechanical damage; do not use balls with cracks.

4.2. Working with Plastic Parts

- Do not heat the balls or rods — the material degrades at temperatures above $+50\text{ }^{\circ}\text{C}$.
- Do not expose the parts to direct sunlight for extended periods.
- Do not use organic solvents (acetone, alcohol, toluene) for cleaning — they damage the plastic and the paint.
- Disassemble the models carefully; do not apply excessive force, so as not to break the rods or widen the holes.

4.3. Protection against injuries

- The ends of the rods may be pointed; avoid direct contact with the eyes and facial skin.
- Do not lean or step on the kit, to avoid spilling small parts.
- Position the balls correctly on the table so that they do not roll away.

4.4. It is strictly prohibited

- Using the kit's parts as toys, projectiles, or building material.
- Immersing the entire package in water or exposing it to moisture.
- Disassembling the rods or attempting to elongate them.
- Using the kit's parts with glue, nails, or other methods, except for inserting them into the balls' holes.
- Heating or burning the parts.
- Leaving the kit in a humid environment or near heat sources.

5. Preparation for Use

- 5.1. Free the kit from its packaging. Read this passport to become familiar with the package contents and the color coding of the elements.
- 5.2. Lay out all the parts on a clean flat surface. Count and check the presence of all components according to section 3.
- 5.3. Make sure all balls have clearly defined holes without cracks or burrs, and that the rods are not bent.
- 5.4. If necessary, carefully wipe the balls and rods with a soft dry material to remove dust accumulated during manufacturing.
- 5.5. Organize the work area so that the parts do not spill; it is recommended to use small containers for storing individual parts.
- 5.6. Before disassembling completed models, make sure students understand the disassembly sequence and know how to correctly remove the rods from the holes.
- 5.7. If the kit was transported at a temperature below +5 °C, let it sit at room temperature for at least 1 hour before use.

6. Operating Procedure

6.1. Selecting Atoms for the Model

- Determine the number and types of atoms needed to assemble the molecule.
- Select the balls by color and number of holes — the number of holes corresponds to the valency of the element.
- If the required ball is unavailable, use a beige universal ball with the corresponding number of holes and hybridization.

6.2. Connecting Atoms with Rods

- For single bonds, insert rigid rods 27 mm long: push one end of the rod into the hole of one ball as far as it will go, then fit the second ball onto it.
- For double and triple bonds, use flexible rods 43 mm long: for a double bond, connect two atoms with two parallel rods, for a triple bond — with three.
- Flexible rods form an arc when inserted into the holes — this is normal and corresponds to the actual geometry of the molecule.

6.3. Hole Placement and Molecular Geometry

- The angular arrangement of the holes in the balls reproduces the actual spatial structure of the molecule: linear (180°), bent (105°), trigonal (120°), trigonal pyramidal (107°), tetrahedral (109°28'), trigonal bipyramidal (120°/90°), octahedral (90°).

6.4. Using P-Orbitals

- Insert the petal-shaped parts (P-orbitals) into the holes of the balls to visually show the shape and spatial orientation of p-orbitals during the formation of chemical bonds.

6.5. Finishing the work

- Disassemble modeled molecules carefully, pulling the rods along the axis of the holes, not sideways.
- Do not wiggle the rods forcefully and do not pry them with sharp objects.
- Put all the parts back into the packaging in order, so that nothing is lost.

7. Care, Maintenance and Troubleshooting

7.1. Cleaning

- Wipe the balls and rods with a dry or slightly damp soft cloth.
- Avoid using abrasive materials, metal brushes, and aggressive chemical substances.
- To remove stubborn dirt, dampen a cloth with warm water and a small amount of neutral dish-washing detergent, then wipe dry.
- Make sure the parts are completely dry before storage.

7.2. Periodic inspection

- Every month, check whether the rods have bent or the holes in the balls have widened.
- Make sure the lacquer coating on the balls is not peeling; if chipping appears, the part should be replaced.
- The kit does not require any lubrication or calibration operations. In case of significant damage, contact an authorized service center.

7.3. Possible malfunctions and methods of their elimination

Symptom	Possible cause	User actions
The rod does not fit into the hole	The hole is clogged or deformed; the rod is bent	Check whether the hole is free; try a different pair of connections; replace the bent rod
The part falls off easily, the connection is weak	The hole has widened from frequent use	Use a rod with a slightly larger diameter; try replacing the ball
Paint chipping is visible on the surface of the ball	Contact with abrasive material or organic solvent	Stop using that ball and replace it from spares or with a different element
The flexible rod is stuck in position and does not return to a straight state	The material has warped or dulled	Carefully straighten the rod by hand; replace it if necessary
A part is stuck in the hole of another ball during disassembly	Excessive force during insertion	Do not make sudden movements; carefully turn and pull the rod; if necessary, ask an adult for help

8. Storage and Transportation Conditions

- Store the kit in a dry room at a temperature not below +5 and not above +40 °C and relative humidity not exceeding 80%.
- Protect the product from direct sunlight and from heat sources.
- For storage, use the original packaging or a container that prevents small parts from spilling out.
- Place the packaging on a horizontal surface in a stable position.
- Transport the kit in rigid packaging by any enclosed type of transport.
- Avoid dropping objects onto the packaging and extreme temperature fluctuations during transport.
- The storage period before commissioning is unlimited provided that the stated requirements are observed.

9. Warranty Obligations

- 9.1. The warranty period of operation of the product is 12 months from the date of sale specified in the warranty card.
- 9.2. The manufacturer guarantees that the product conforms to the declared technical specifications provided that the transportation, storage and operating rules set out in this passport are observed.
- 9.3. During the warranty period, defects of the product that have arisen through the fault of the manufacturer are remedied free of charge. The method of remedy (repair, replacement of a component or replacement of the product) is determined by the service center.
- 9.4. Warranty service is provided on presentation of a correctly and completely filled-in warranty card and of a document confirming the fact and the date of purchase.
- 9.5. The warranty does not cover cases where the malfunction is caused by:
 - mechanical damage, in particular cracks, chips and deformation of the housing and of the components of the product;
 - violation of the operating, storage or transportation rules set out in this passport;
 - ingress of liquid or foreign objects into the product, and also the action of insects and animals;
 - independent disassembly, repair or modification of the product, in particular repair at unauthorized workshops;
 - use of the product other than for its intended purpose;
 - force majeure circumstances (fire, flood, earthquake, etc.).
- 9.6. The warranty does not cover the natural wear of the coating and of the appearance of the product, nor consumables.

10. Product Disposal

- The product is not electrical or electronic equipment, therefore the marking in the form of a crossed-out container does not apply to it.
- After the end of the service life, the product is disposed of according to the rules established at the institution that operated it, with prior separation by materials.
- Hand over the packaging elements (cardboard, polymer materials) to the corresponding streams of recyclable materials.

Contacts

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Conditions of use and storage of the product

The product is intended for educational work in general secondary education institutions and is used only under the control and supervision of a teaching staff member; the recommended age of students — from 10 years, that is, students of grade 5 and of higher grades. Keep the product in a dry, clean and ventilated room at a temperature from +5 to +40 °C and relative air humidity up to 80 % without condensation, separately from heat sources and out of direct sunlight, moisture and dust. Use the product exclusively for its intended purpose and do not allow drops, impacts or other mechanical damage. If you notice damage, a crack or any malfunction, stop working with the product immediately and inform the teacher or the responsible person of the educational institution; repairing the product on your own is prohibited.

WARRANTY CARD

Name:	Handout set of atom models
Product model:	LABOTRIX ATOMIX A2
Serial number:	
Date of sale:	
Warranty period:	12 months from the date of sale
Trading organization:	
Signature of the seller:	

The goods have been received in working order, without visible damage, complete, and have been checked in my presence. I have no claims regarding the quality of the goods; I have read and agree to the operating and warranty service conditions.

Full name of the buyer _____

Telephone of the buyer _____ Signature of the buyer _____

Dear Customer!

Thank you for choosing Labotrix products. After-sales service of this product is provided in accordance with the regulations of the company and the legislation of the country of sale. So that we can serve you quickly and without unnecessary formalities, check that this warranty card is filled in correctly at the moment of purchase and keep it together with the payment document throughout the entire warranty period. When applying for repair, hand the product over to the seller or to the service center together with the filled-in card.

Procedure for applying

1. The right to free warranty service of the product is valid for 12 months from the date of sale specified in the warranty card. Within this period, components that have failed because of a manufacturing defect are repaired or replaced at no cost to the buyer.
2. Before applying, make sure that the malfunction is not caused by the reasons listed in section 9 of this passport and, if possible, use the table of possible malfunctions in subsection 7.3.
3. After the end of the 12-month warranty period, repairs are performed on a paid basis; the cost of the work and of the spare parts is determined depending on the nature of the malfunction.

Grounds for refusal of warranty service

The company reserves the right to refuse free service or to perform the work on a paid basis if at least one of the following circumstances is established:

- absence of the warranty card, its incomplete or corrected completion, and also the absence of a document confirming the purchase;
- non-conformity of the serial number of the product with the number specified in the card, or damage to the factory marking;
- traces of independent disassembly, repair or modification of the product;
- damage caused by violation of the operating rules, connection to an unsuitable power source or external mechanical impact;
- damage as a result of force majeure circumstances.

Service Records

Date of entry	Description of the malfunction	Work performed	Position, signature, full name of the responsible person