

MICROWAVE ASSISTED SYNTHESIS WORKSTATION MAS-II PLUS



The Microwave Assisted Synthesis Workstation MAS-II Plus is a flexible and efficient reaction platform designed to support a wide range of laboratory experiment plans. It is built for researchers who require controlled, repeatable, and faster chemical reactions compared to conventional heating methods. The system combines advanced microwave heating with an adaptable workstation design, making it suitable for both routine experiments and complex research workflows.

Designed with ease of use in mind, the MAS-II Plus features intuitive operation that helps simplify experimental setup and execution. Its adaptable configuration allows researchers to adjust reaction conditions quickly, improving productivity while maintaining reliable results. The workstation supports consistent reaction control, which is essential for reproducibility in laboratory research and development.

The MAS-II Plus is widely used across organic synthesis, pharmaceutical chemistry, organic extraction, food science, analytical chemistry, inorganic chemistry, protein research, petrochemical engineering, and materials chemistry. By providing a versatile microwave-assisted reaction environment, it enables faster heating, improved reaction efficiency, and better experimental control. This makes the MAS-II Plus a practical upgrade for laboratories seeking higher performance than traditional heating platforms.

Key Highlights

- Microwave assisted synthesis workstation for laboratory research
- Adaptable design to support multiple experimental plans
- User-friendly operation for efficient daily use
- Provides faster and more uniform heating than conventional methods
- Suitable for a wide range of chemistry and materials research fields
- Reliable platform for research, development, and experimental optimization

APPLICATIONS

- **Organic Synthesis:** Supports multi-step organic reactions, esterification, condensation, and selective photochemical synthesis under controlled conditions.
- **Pharmaceutical Research:** Accelerates drug discovery, formulation studies, and protein chemistry through precise reaction environments.
- **Polymer & Material Science:** Facilitates polymerization, nanomaterials development, graphene studies, and composite material research.
- **Environmental Analysis:** Enables microwave-assisted extraction of pollutants, organics, and trace elements from soil and water samples.
- **Biotechnology & Life Sciences:** Optimized for DNA and RNA preparation, protein denaturation, and biochemical pathway investigations.
- **Nanotechnology:** Produces uniform nanostructures using combined microwave, ultrasonic, and UV irradiation techniques.
- **Academic & Industrial R&D:** Provides scalable experiments (50 ml–2000 ml) that bridge laboratory research with pilot-scale production.
- **High-Pressure Reactions:** Safely conducts sealed reactions up to 230°C and 5 MPa, enabling advanced chemical synthesis.

FEATURES

Main Technical Parameters

The microwave power is controlled using precise closed-loop PID technology, achieving inverter control during the reaction process. This enables non-pulse microwave continuous heating, with an automatic power variation range from 0 to 1000W. The power can be adjusted automatically based on temperature programming via Inverter technology and closed-loop control technology.

Microwave Assisted Synthesis MAS-II Plus

2. The stainless cavity with a large capacity and multilayer Teflon spray ensures safety for human contact with any open part of the microwave oven cavity. Microwave leakage is significantly below the national standard and has received CE certification. The anti-corrosion high-power draught fan facilitates an exhaust air rate of 5.8M³/Min, allowing for rapid cooling.

3. The dual-channel temperature detection (DTD) technology uses Pt100 thermocouples and non-contact infrared rays to detect temperature. The system automatically selects the temperature measurement method, monitoring and controlling reaction temperature in real time. The infrared temperature measurement range spans from 0℃ to 900℃ with a precision of $\pm 1^\circ\text{C}$, while the Pt100 thermocouple temperature measurement covers 0℃ to 300℃ with a precision of $\pm 1^\circ\text{C}$. The standard equipment's maximum operational temperature is 300℃.

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4. Microwave Assisted Synthesis Workstation MAS-II Plus offers two stirring methods: mechanical stirring and magnetic stirring, which can be easily switched to suit different reactive materials. The stirring speed is continuously adjustable and displayed for both types. The magnetic stirring operates at a revolving speed of 30 to 1600 r/min with stepless-speed control, ideal for regular solution reactions. Meanwhile, the digital paddle-type mechanical stirring operates at a revolving speed of 30 to 1700 r/min with stepless-speed control. This mechanical stirring can rotate in both clockwise and anticlockwise directions, catering to high-viscosity liquid reaction experiments.

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5. The standard configuration includes reaction vessels with standard interfaces ranging from 50ml to 1000ml in volume. Users have the flexibility to select various experiment conditions, and the equipment comes equipped with essential devices such as interfaces for inert protection gas, reflux condensation, droplets, and water diversion.

6. It comes preloaded with 50 sets of built-in reaction programs that users can freely edit and save. Each reaction parameter—scheme, step, temperature, time, power, etc.—is displayed and controlled. The reaction temperature is showcased through a curve graph over time.
7. The equipment features software for tracking, displaying, recording, invoking, and saving the reaction procedures.
8. A photographic device is installed within the furnace chamber along with a TFT color LCD monitor external to the chamber, allowing real-time observation of the reaction process.
9. With applications across various fields including organic synthesis, pharmaceutical chemistry, organic extraction, food science, analytical chemistry, inorganic chemistry, protein research, petrochemical engineering, and materials chemistry, this equipment offers a superior reaction platform compared to traditional heating platforms.

THEORY & METHOD

Utilizing a unique patented technology called dual-channel temperature detection (DTD), the Microwave Assisted Synthesis Workstation MAS-II Plus uses both PT thermocouple sensors and non-contact infrared rays to measure temperature. These methods switch automatically based on test requirements, ensuring safe and reliable operation even in environments rich in organic solvents.

Moreover, the Microwave Assisted Synthesis Workstation MAS-II Plus utilizes advanced closed-loop control PID technology to precisely adjust microwave power in correspondence with temperature changes. This continuous-heating approach, using a non-pulse microwave type, guarantees uniformity and repeatability in the reaction product. Its robust industrial-grade furnace chamber structure and multilayer chemical-resistant coating ensure durability in rigorous chemical environments.

To accommodate various reaction schemes, the Microwave Assisted Synthesis Workstation MAS-II Plus offers 50 built-in reaction programs that can be customized, edited, and saved as needed. Real-time temperature curves of the reactants are displayed during reactions, allowing observation of the entire process on a color screen.

To meet diverse reaction needs, this product features an access entry for protective inert gas. It allows for two stirring methods, mechanical and magnetic stirring, which can be switched at any time, with continuously adjustable stirring speeds. Additionally, operations like reflux condensation, liquid dropping, and water diversion can be executed during the reaction process.

The equipment's highest theoretical operating temperature reaches 900°C (Customized reactor vessel and furnace chamber environment are required for this case).

TECHNICAL SPECIFICATIONS

Power supply	220-240 VAC 50/60Hz 9A (110V is also available. Please specify when ordering)
Microwave source	2450MHz □ 0-1000W continuous and automatic adjustment with temperature programming, PID technology
Microwave oven cavity	Stainless steel cavity with large volume, multilayer anticorrosive PFA Teflon painting.
Temperature measurement control system	The Dual-channel Temperature Detection (DTD) technology automatically determines the temperature measurement mode. The infrared temperature measurement spans from 0°C to 900°C with a deviation of $\pm 1^{\circ}\text{C}$, while the Pt100 thermocouple temperature measurement covers 0 to 300°C with a deviation of $\pm 1^{\circ}\text{C}$.
Operating temperature	Standard configuration instrument's maximum operating temperature is 300°C and the maximum theoretical operating temperature is 900°C (peculiar configuration).
Video system	Standard configuration photographic device built-in furnace chamber and 7" color TFT-LCD monitor. Reaction process will be displayed in time.
Stirring system	The standard configuration includes a magnetic stirring system with a revolving speed ranging from 30 to 1600 r/min and a digital mechanical paddle-type stirring system with a revolving speed ranging from 30 to 1700 r/min.
Reaction vessel	50-1000ml standard reaction vessel, condenser, backflow and liquid adding accessory.
Operating ambient temperature/humidity	0-40 °C / 15-80% RH

Complete machine physical size	17.7 inches X 20.3 inches X 20.1 inches.
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