Technical Specification of RayKol XTrust series Microwave Digestion System XT-iMD

1. Working condition

1.1. Temperature: 0 to 40°C
1.2. Humidity: 15 to 80%
1.3. Power: 220 to 240VAC, 50/60Hz

2. Technical specification & requirement

2.1. Requirement: used for acid digestion, solvent extraction; to pretreat samples prior to AAS, AFS, ICP, ICP-MS.

2.2. Main unit

2.2.1. Power and frequency: Resonant programed high-pressure microwave power with high frequency and large power. Industrial double magnetrons, output power: 0 to 2400W(adjustable); microwave frequency: 2450MHz.

2.2.2. ★Microwave is fed into from the bottom to samples, for recevicing more effective and even microwave energy.

2.2.3. Microwave cavity: 316L stainless steel sqaure chamber, laser-welded, volume: 65L; multi-layer PFA coatings on surface, corrosion resistant.

2.2.4. Structure of door and sealing mechanism: high-strength explosion-proof door, side opening with float buffer mechanism, able to release part of pressure when pressure in chamber is too large; configure with mechanical and electrical sealing mechanism for safety measures and better user experience.

2.2.5. Anti-corrosive ventilation system: flowrate≥5.3m^3/min, to exhuast extra heat during digestion then extend service life of digestion vessels, for rapid cooling after digestion.

2.2.6. ★Microwave safety: multiple microwave shielding in cavity; microwave leakage≤0.2mW/cm^2 when working with full power.

2.2.7. Sample loading: side loading, load and remove each sample one by one, do not need remove the rotor.

2.2.8. Unit dimension: 600×650×755 mm; net weight: 70kg.

2.3. Temperature and pressure control

2.3.1. ★Utilize mid-infrared contactless temperature sensor that can penetrate through TFM vessels, able to scan and monitoring the actual temperature of all sample solution in real time, and show the curve of temperature changing; Range of temperature control: room temperature to 400°C, precison: ±0.1°C.

2.3.2. ★Utilize contactless pressure control system to all vessels. During high-pressure digestion, it can monitor the pressure of all digestion vessels in real time, alarm and automatically adjust or stop microwave when over pressure; able to show any change of pressure value of all vessels.

2.3.3. Range of pressure measuring: 0 to 10Mpa, precision: ±0.01Mpa.

2.4. Rotor and digestion vessel

2.4.1. Separate rotor: able to assemble digestion vessels to rotor without any tools; ensure safety in microwave chamber, avoid corrosion by acid fume; each vessel has automatic pressure release mechanism, able to continue digestion after releasing pressure, no consumables required.

2.4.2. Rotation of digestion rotor: continuously rotate in 360°.

2.4.3. ★Vessel volume and sample count: able to process 16, 42 samples per batch. Sample vessel: 100mL (high pressure, for 16 position), 75mL (high throughput, for 42 position).

2.4.4. ★Material of digestion vessel: all utilize high-strength material, resistant to high temperature and corrosion.
100mL high-pressure vessel: high-strength PEEK material as vessel, made via single molding, minimal stress and improved safety performance for digestion; modified TFM material as vessel insert, bottom thickness ≥18mm, for tolerance to high pressure.
75mL high-throughput vessel: PEEK material as vessel; modified TFM material as vessel insert, bottom thickness ≥10mm, for tolerance to high pressure.

2.4.5. ★Max. temperature resistance: ≥300°C, working temperature: 0 to 250°C; Max. pressure resistance: ≥15Mpa, working pressure: 0 to 6Mpa (for 16 position with 100mL vessels), 0 to 4Mpa (for 42 position with 75mL vessels).

2.5. Control software

2.5.1. Smart control: built-in touch screen control, intuitive and simple software interface; real-time display parameters and operation process (such as temperature and pressure change); standard configuration with RS232 port, for PC connection.

2.5.2. Method setting

2.5.2.1. Able to edit, change, save 100 methods, each method could set 10 digestion steps.

2.5.2.2. Able to save the method and process data of each digestion, for reviewing digestion history and data

2.5.3. Able for programed temperature increase, gradient temperature increase: set the rate of temperature increase and time.

2.5.4. ★Vessel detection: able to detect rotor type, vessel type, sample count by sensor

2.5.5. Built-in cooling mode: 3 centrifugal ventilation fans to reach rapid cooling, parameter adjustable.

2.5.6. Built-in power correction: able to accurately adjust the microwave output, to ensure consistency of experiment.

2.5.7. Built-in temperature calibration: able to calibrate mid-infrared temperature, to ensure safety.

2.5.8. Multi-level management for user interface is included in setting, instantly record every operation done on the unit, easy for equipment management in laboratory.

2.5.9. Built-in operation oversight, record any operation, unable to change log.

2.6. Safety measure

2.6.1. ★Over 10 active and passive safety features, including industrial cylinder cavity, buffer explosion-proof door, real-time monitoring of temperature and pressure, alarm for

over-pressure, elastic mechanism of pressure release, over heat and current protection, detection of abnormal sound, faulty alarm, vessel material with extreme temperature and pressure resistance, non-destructive pressure releasing groove, centrifugal ventilation fans, to protect users and instrument from hazardous gaseous substances.

2.6.2. Utilize high-precision temperature and pressure control system, user can observe operation process through the change in data and curve of temperature and pressure.

2.7. Acid eliminator

2.7.1. Range of temperature control: room temperature to 250°C.

2.7.2. Precison of temperature control: ±0.5°C; LCD digital display.

2.7.3. Sample capacity:
For high-throughput, sample count: 25, diameter for each position: 29mm; temperature difference between each position ≤±1.0°C
For high-pressure, sample count ≥16, diameter for each position: 42mm.

2.7.4. Corrosion-resistant treatment to entire eliminator, Teflon anti-corrosive coating on operating surface, with over-heating protection and humming alarm reminder.

3. Configuration

3.1. Main unit*1 (including integrated control system, control software, ventilation pipe, wrench for vessels)

3.2. Digestion rotor and vessels

3.3. Acid eliminator