



Ion Coater

SPT-20 Operating Manual



COXEM Co., Ltd.

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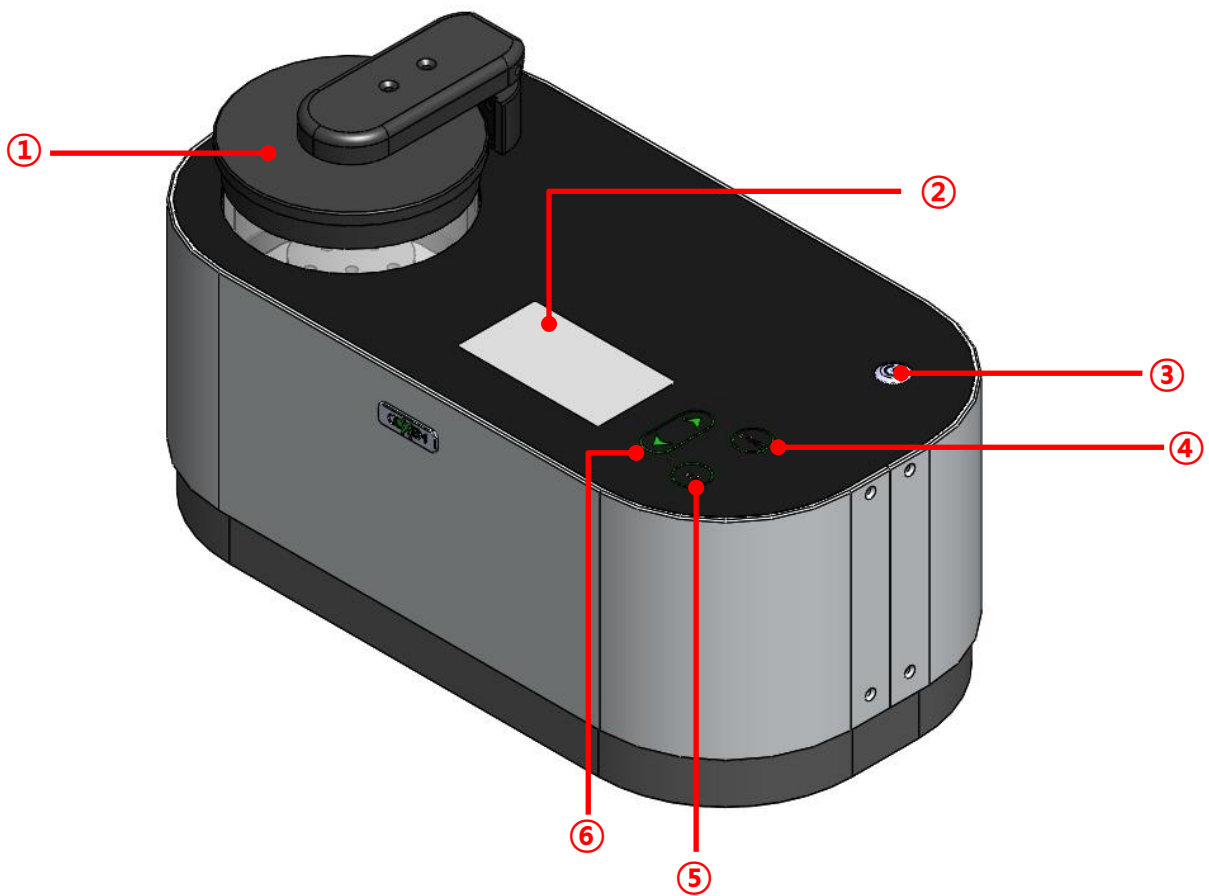
- Before using the instrument, please read this manual carefully and understand the directions. Keep the manual in a conspicuous place.
- Some devices or functions in the manual may not be provided and can be different depending on relevant accessories.
- Images on the cover page or in the manual are for illustration, which may look different from actual instruments.
- The instrument and contents in this manual may be revised for improvement without prior notice.

1. Introduction

1.1 Descriptions on Instrument Parts

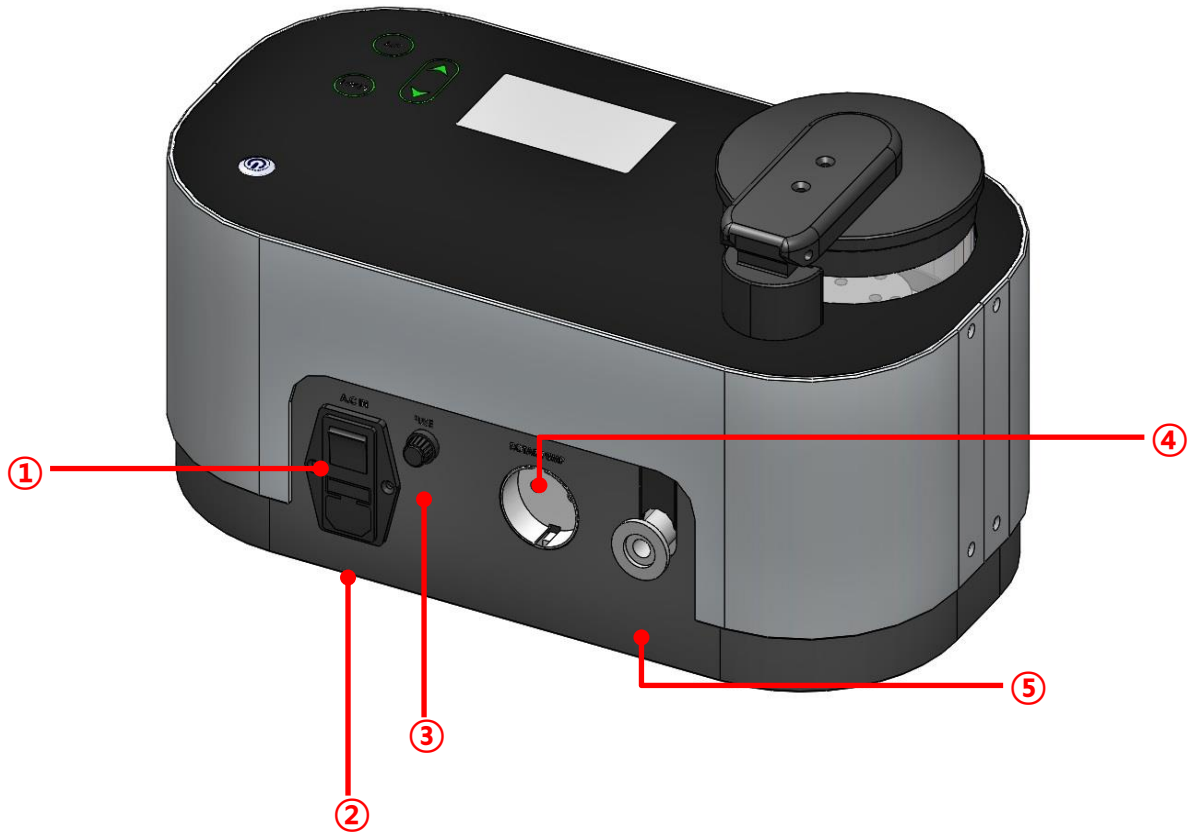
Names and functions of the parts of SPT-20 are described as follows.

1.1.1 Main Unit of SPT-20



No.	Items	Descriptions
①	Vacuum Chamber	Target inside - Standard: Au / Pt - Option: Cu, Pd, Pt-Pd, Ag, Al
②	Display LCD Screen	Indicated operation
③	Power	Display screen and operation turning ON/OFF
④	START	Operation starts
⑤	SET	Setting a value for coating
⑥	UP/DOWN	Change a value for coating

1.1.2 View from Back of SPT-20



No.	Items	Descriptions
①	Main Power	Main system and rotary pump turning ON/OFF
②	System Power cable plug	Connection for system power cable
③	Fuse Holder	Fuse(1.5A) inside
④	Vacuum pump power cable plug	Connection for power cable of vacuum pump
⑤	Vacuum valve connector	Connects to the vacuum pump -Should use the provided NW16 clamp

1.2 Cautions before Use

1.2.1 Precautions on Handling

If fine dust or debris gets inside the microscope, the instrument may not function properly. Wear gloves and do not touch the parts inside the vacuum area with hands directly.



Example of Proper Attire

1.2.2 Permission by Operation

Following operations should be entrusted to specific personnel as described below.

Division of operations	Detailed performances
General operation	System operator
Calibration	Certified engineer from maker
Hardware replacement	Certified engineer. From maker
General maintenance	Certified engineer or person who completed maintenance training.

1.2.3 Safety Guidelines

Before using SPT-20, review the following instructions carefully

Items	Descriptions
WARNING	Instructions which, if not followed, can cause severe injuries to user
CAUTIONS	Instructions which, if not followed, can cause moderate injuries or damage to the instrument.

CAUTIONS

- Excessively high surrounding temperature can cause defects or malfunction of the instrument. Please maintain a proper instrument installation environment.
(Temperature $20\pm 5^{\circ}\text{C}$, humidity: Less than 60%)
- When placed in excessively low temperature, the instrument may experience reduced vacuum performance due to the changing oil viscosity of the rotary pump. Be sure to keep the instrument above the optimum temperature.
(Normal operating temperature: $20\pm 5^{\circ}\text{C}$)
- Do not install the instrument on the floor with excessive external vibration (Recommended vibration level is below 35 dB, but there is no trouble to operate)
- When the rotary pump operates, its surface temperature rises. To prevent high heat from causing fire, do not place ignitable or combustible substances near the pump during operation.
- When opening or closing the vacuum chamber, do it slowly to prevent injuries.
- To assure proper operation of the instrument, follow the directions described in this manual.
- Contact the maker's service representative when moving the instrument. Arbitrary moving or installing can cause failure or damage of the instrument, which will result in additional expenses for after-sales service.
- Do not revise or remodel the hardware arbitrarily. Doing so can cause fire or electric shock, which will result in additional expenses for after-sales service.
- Do not off main power during "Emergency Stop"

2. Specification

2.1 Rotary vacuum pump

	Descriptions
Electronic	AC 110V or 220V, 50/60 Hz, 0.12 kW
Dimension	120(W) X 373.5(D) X 200(H) mm
Motor Speed	1,700 rpm
Ultimate Pressure	$\leq 3 \times 10^{-3}$ Torr (4.0×10^{-1} Pa)
Oil Capacity	0.2L
Inlet, Outlet port	NW16
Weight	14.2 kg

2.2 Ion Coater

	Descriptions	
Power	AC 110/220V, 50/60 Hz, 50W	
Dimension	420(W) X 220(D) X 230(H) mm	
Target	- Standard: Au / Pt - Option: Cu, Pd, Pt-Pd, Ag, Al	
Size(d)	Chamber	100 mm
	Target	50 mm
	Stage	60 mm
Current Range	0 ~ 9 mA	
Coating Time Range	10 ~ 300 sec	

2.3 Composition

Item	Number(ea)
Main unit	1
Rotary Pump	1
Au Target	1
Power Cable	1
Vacuum Hose	1
Operation Manual	1

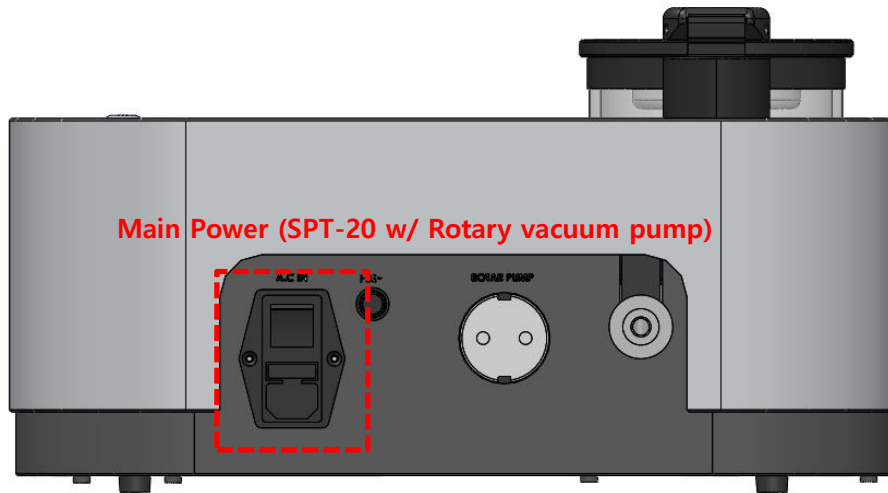
2.4 Installation Requirement

Clean, Dry, Dust Free surface,

Factor		Requirement
Temperature		15 ~ 30°C (59 ~ 86°F)
Humidity		Less than 60%
Electronic	Voltage	Single Phase, 220V ± 10%,
	Power consumption	1 kW
	Frequency	50 ~ 60 Hz

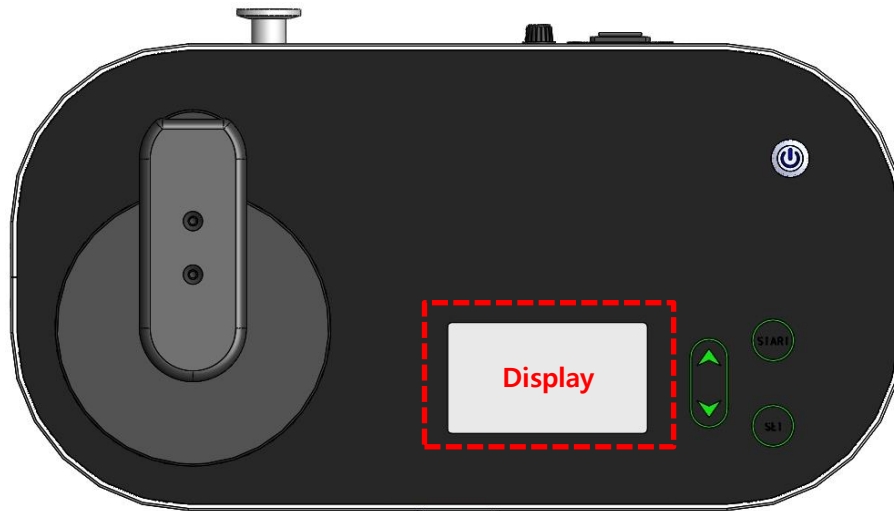
3. Operation

3.1 Power On



- ① Switch on back side from SPT-20. At this time, Rotary vacuum pump's power must be plugged in SPT-20
- ② After press a power in up-side, Vacuum Begins immediately that reaches to 0.1 torr within 3min
- ③ Then Self Diagnosis starts
 - POWER OK!
 - V-Sensor OK!
 - Touch SW OK!

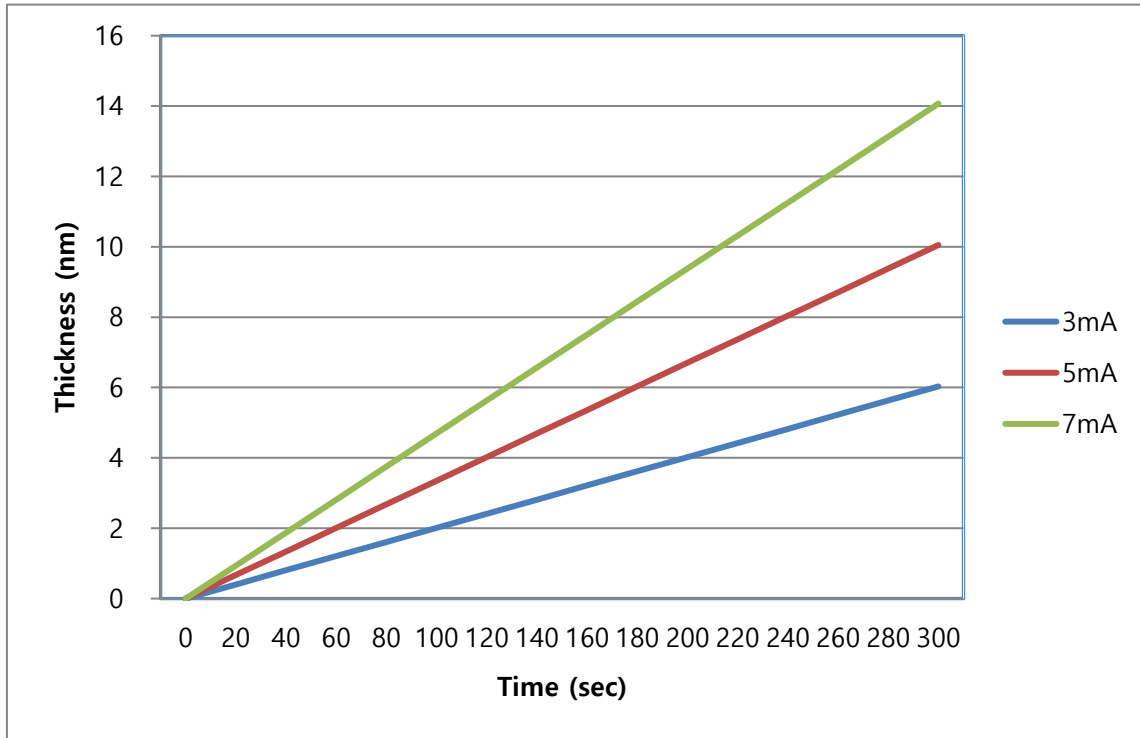
3.2 Set-up



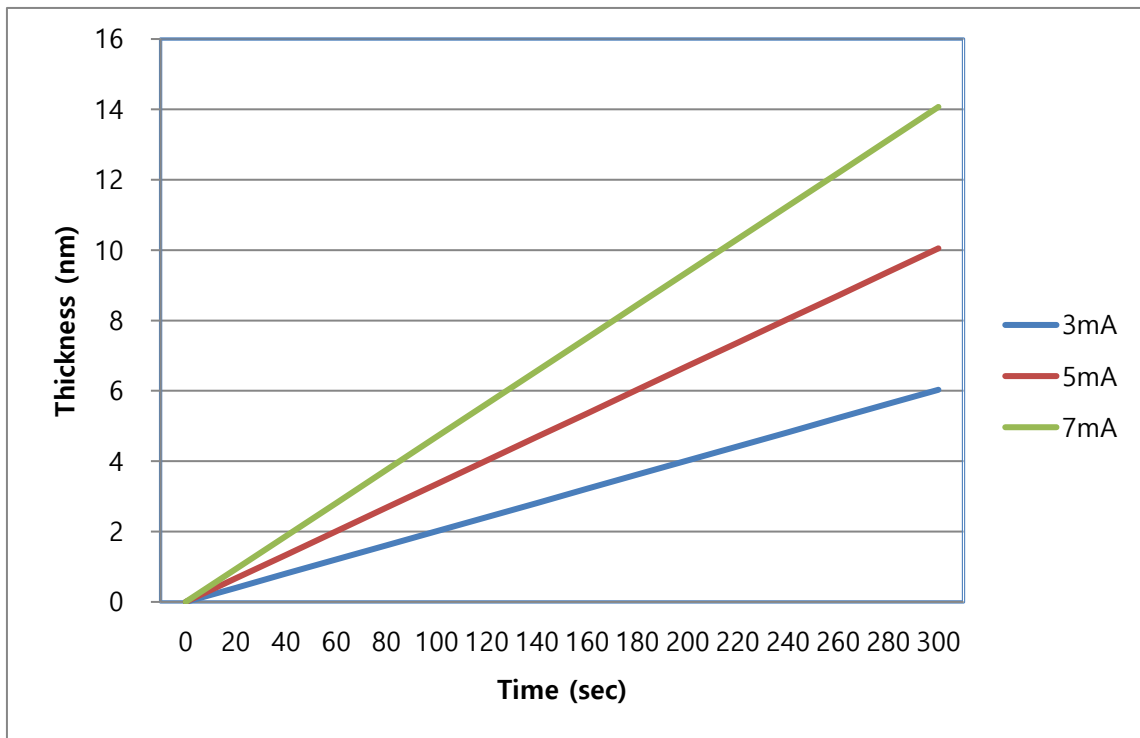
- ① After Self-Diagnosis, displayed a coating set-up mode
- ② Set points are,
 - Target: Au, Pt, Cu, Pd, Pt-Pd, Ag, Al (STD: Au / Pt)
 - Current: 1 ~ 9 mA
 - Time: 10 ~ 300 Sec
 - General: 3mA / 120 sec
 - It depends on sample's properties
- ③ After set on, press "START" 2 ~ 3 sec
- ④ Starts coating progress after vacuum level reached 100% (0.1 Torr)
- ⑤ After setting time, Displayed "Complete!!"
- ⑥ Emergency Stop: Press a "START" about 2 ~ 3 sec in progress. After then stopped progress with displaying "CANCEL"

3.3 Coating Thickness

① Au Target

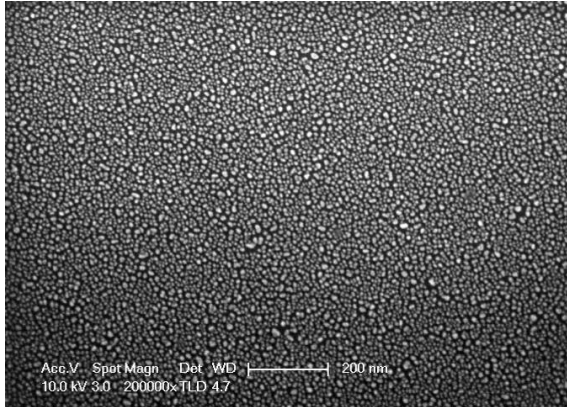


② Pt Target

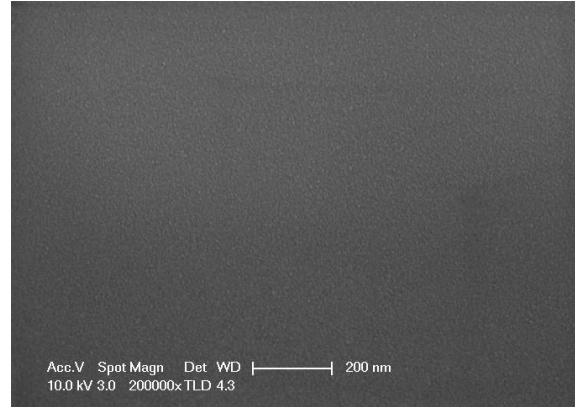


4. Measurement

4.1 Measurement of sample due to target



Au

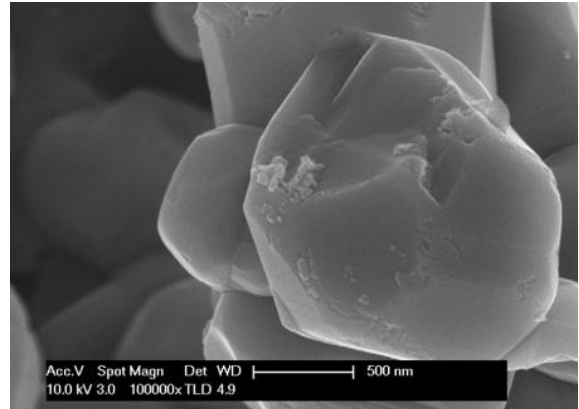
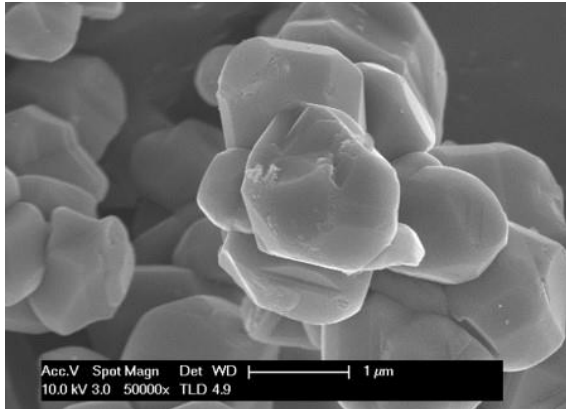


Pt

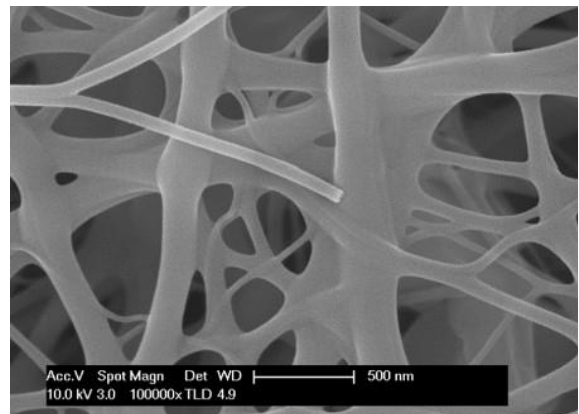
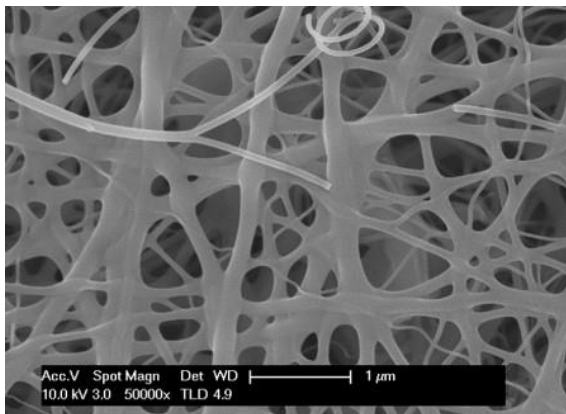
Test condition

WD	4.3mm
HV	10.0kV
Mag	x200k
Instrument	FE-SEM by FEI

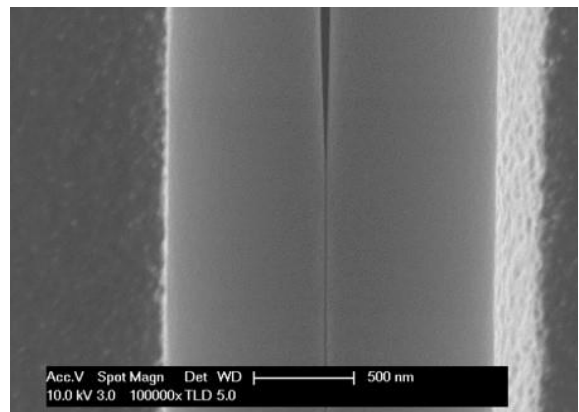
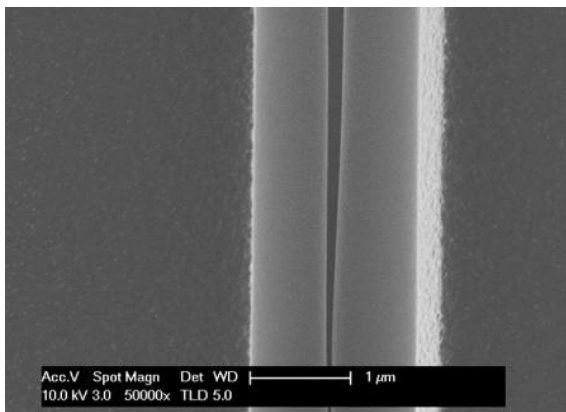
4.2 Measurement of variety samples through Au coating



Carbon Powder



Membrane



Si fiber

5. Maintenance

5.1 Error List

- ① "V-sensor error": Normally occur by vacuum → Request SVC
- ② "Touch SW error": Normally occur by touch program → Request SVC

5.2 Replacing Target



- ① First, Wearing poly gloves then remove insulation support of the electrode



- ② After tilting the upper with target 45° then remove a nut of high voltage electrode plate. It should tilt 45° also when re-assemble



- ③ It should be checked target and nut tightening when you re-assembling the target

5.3 Cleaning of chamber

- Required item: wipes for laboratory, methyl-alcohols, blowing air



① Wet wipes by methyl-alcohols



② Cleaning inside of chamber, rubber pad that wrapped around chamber and flange surface inside chamber

**Request SVC: Migun Techno World #201, Migun Technoworld, 199
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