Transmission Electron Microscope - JEM 2100F

The main components of the microscope are:

Electron source: Schottky field-emission gun operating at accelerating voltages between 80 and 200 kV. The microscope is mostly operated at an accelerating voltage of 200 kV and energy spread of 0.8 eV.

Objective lens: 'UHR' pole-piece with a spherical aberration of approximately 0.5 mm. The TEM point resolution and information limit are 0.19 nm and 0.12 nm, respectively. The HAADF and BF STEM resolution are 0.2 nm.

Off-axis electron holography: JEOL biprism, 0.6 μm diameter platinum wire.

EDS: JEOL 50 mm^2 Si(Li) detector, solid angle 0.24 srad, energy resolution of 133 eV (Mn K edge).

EELS: GIF Quantum including a fast shutter (1000 spectra/sec).

STEM: JEOL bright-field and HAADF detectors; Gatan bright-field, dark-field and HAADF detectors. The latter detectors enable parallel acquisition of EELS and HAADF signal.

CCD camera (x2): Gatan Ultrascan 1000, 2k x 2k.

Sample holders: JEOL strong double tilt, Gatan analytical tilt/rotate, Gatan LN_2 cooling, Fischione tomography.

For sample preparation, we have tripod mechanical polishing, 1010 Fischione ion miller and 1020 Fischione plasma cleaner.

Data analysis at a dedicated computer lab installed with Digital Micrograph, JEMS, MacTempas.

Equipment Specifications (as given by JEOL):

Resolution	
Lattice Image	0.1nm
Point Image	0.19nm
Accelerating Voltage	
Range	80 - 200 kV
Variable Steps	50 V min.
Stability	2 ppm/min.
Magnification (steps)	
Mag Mode (30)	x2,000-1,500,000
Low Mag Mode (20)	x50-6,000
SA Mag Mode (21)	x8,000-800,000
Camera Length (steps)	
SA DIFF (15)	80-2,000mm
HD DIFF (14)	4-80mm
HR DIFF	333mm
Objective Lens	
Polepiece	URP
Focal Length	1.9mm
Spherical Aberration Coefficient	0.5mm
Chromatic Aberration Coefficient	1.1mm
Minimum Focal Step	1.0nm
Exciting Current Stability	1 ppm/min.
Specimen Stage	Micro active goniometer
Specimen Chamber	
Specimen per Load	1
Specimen Tilt Angle (X-axis)	±25°
Specimen Tilt Angle (Y-axis)	±25°
Specimen Movements	
X Direction	2.0mm
Y Direction	2.0mm
Z Direction	0.2mm (±0.1mm)