

Materials List for:

# Experimental Methods for Efficient Solar Hydrogen Production in Microgravity Environment

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URL: <https://www.jove.com/video/59122>

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## Materials

Name	Company	Catalog Number	Comments
12.7 mm XZ Dovetail Translation Stage with Baseplate, M4 Taps (4 x)	Thorlabs	DT12XZ/M	
Beam splitters (2 x)	Thorlabs	CM1-BS013	50:50 400-700nm
Beamsplitters (2 x)	Thorlabs	CM1-BS014	50:50 700-1100nm
Ohmic back contact: 4 nm Au, 80 nm Zn, 150 nm Au	Out e.V., Berlin, Germany	<a href="https://www.out-ev.de/english/index.html">https://www.out-ev.de/english/index.html</a>	Company provides custom made ohmic back contacts
Glass tube, ca. 10 cm, inner diameter about 4 mm	E.g., Gaßner Glasstechnik		Custom made
p-InP wafers, orientation 111A, Zn doping concentration: $5 \times 10^{17} \text{ cm}^{-3}$	AXT Inc. Geo Semiconductor Ltd. Switzerland		Custom made
Photoelectrochemical cell for terrestrial experiments	E.g., glass/ materials workshop		Custom made
Matrox 4Sight GPm (board computer)	Matrox imaging		Ivy Bridge, 7 x Cable Ace power I/O HRS 6p, open 10m, Power Adapter for Matrox 4sight GPm, Samsung 850 Pro 2,5" 1 TB, Solid State Drive in exchange for the 250Gb hard drive
2-propanol	Sigma Aldrich	I9516-500ML	
35mm Kowa LM35HC 1" Sensor F1.4 C-mount (2 x)	Basler AG		
Acetone	Sigma Aldrich	650501-1L	
Ag/AgCl (3 M KCl) reference electrode	WPI	DRIREF-5	
Aluminium breadboard, 450 mm x 450 mm x 12.7mm, M6 Taps (2 x)	Thorlabs	MB4545/M	
Beaker, 100 mL	VWR	10754-948	
Black epoxy	Electrolube	ER2162	
Bromine	Sigma Aldrich	1.01945 EMD Millipore	
Colour camera (2 x)	Basler AG	acA2040-25gc	
Conductive silver epoxy	MG Chemicals	8331-14G	

Copper wire	E.g., Sigma Aldrich	349224-150CM	
Ethanol	Sigma Aldrich	459844-500ML	
Falcon tubes, 15 mL	VWR	62406-200	
Glove bags	Sigma Aldrich	Z530212	
Hydrochloric acid (1 M)	Sigma Aldrich	H9892	
Magnetic stirrer	VWR	97042-626	
Methanol	Sigma Aldrich	34860-100ML-R	
Microscope slides	VWR	82003-414	
MilliQ water			
NIR camera (2 x)	Basler AG	acA1300-60gm	
Nitrogen, grade 5N	Airgas	NI UHP300	
Ø 1" Stackable Lens Tubes (6 x)	Thorlabs	SM1L03	
O2 Plasma Facility			
OEM Flange to SM Thread Adapters (4 x)	Thorlabs	SM1F2	
Parafilm	VWR	52858-000	
Pasteur pipette	VWR	14672-380	
Perchloric acid (1 M)	Sigma Aldrich	311421-50ML	
Petri dish	VWR	75845-546	
Photoelectrochemical cell for microgravity experiments	E.g., glass/ materials workshop		
Polystyrene particles, 784 nm, 5 % (w/v)	Microparticles GmbH	0.1-0.99 µm size (50 mg/ml): 10 ml, 15 ml, 50 ml	
Potentiostats (2 x)	Biologic	SP-200/300	
Pt counter electrode	ALS-Japan	12961	
Rhodium (III) chlorid	Sigma Aldrich	520772-1G	
Shutter control system (2 x)			
Silicon reference photodiode	Thorlabs	FDS1010	
Sodium chlorid	Sigma Aldrich	567440-500GM	
Stands and rods to fix the cameras	VWR		
Sulphuric acid (0.5 M)	Sigma Aldrich	339741-100ML	
Telecentric High Resolution Type WD110 series Type MML1-HR110	Basler AG		
Toluene	Sigma Aldrich	244511-100ML	
Various spare beakers and containers for leftover perchloric acid etc for the drop tower	VWR		
W-I lamp with light guides (2 x)	Edmund Optics	Dolan-Jenner MI-150 Fiber Optic Illuminator	
CM-12 electron microscope with a twin objective lens, CCD camera (Gatan) system and an energy dispersive spectroscopy of X- rays (EDS) system)	Philips		
Dimension Icon AFM, rotated symmetric ScanAsyst-Air tips (silicon nitride), nominal tip radius of 2 nm	Bruker		