

Materials List for:

Fabrication of a Dipole-assisted Solid Phase Extraction Microchip for Trace Metal Analysis in Water Samples

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Materials

Name	Company	Catalog Number	Comments
AutoCAD	Autodesk	N/A	http://www.autodesk.com/education/free-software/autocad
Poly(methyl methacrylate) (PMMA) sheet	Kun Quan Engineering Plastics	N/A	350 mm (L) x 20 mm (W) x 2 mm (H). The glass transition temperature (T _g) of PMMA sheets is ranged from 102–110 °C. The UV transmittance of the PMMA at 365 nm is 91.2%.
Micromachining system	Laser Life	LES-10	Maximum laser power: 10 W. Maximum engraving speed: 762 mm sec ⁻¹ .
High-resolution optical microscope	Ching Hsing Computer-Tech	FS-230	
Power Image Analysis system (PIA)	Ching Hsing Computer-Tech	PIA V16.1	
Multi drilling machines	N/A	LT-848	
Deionized water (D. I. H ₂ O)	Millipore	Milli-Q Integral 5 System	
Sodium dodecyl sulfate (SDS)	J. T. Baker	4095-04	
Ultrasound oscillator	Elma	Transsonic Digital	
Glass board	N/A	N/A	160 mm (L) x 35 mm (W) x 2 mm (H); fragile
Binder clip	SDI	0234T-1	http://stationery.sdi.com.tw/product_detail.php?Key=322&cID=55&uID=6
Precision oven	Yeong Shin	DK-45	
Poly(etheretherketone) (PEEK) tube	VICI	JR-T-6002 (0.5 mm i.d.); JR-T-6001 (0.25 mm i.d.)	
Polymer tubing cutter	Upchurch Scientific	A-327	
Two-component epoxy-based adhesive	Richwang	N/A	Skin irritative. The major components are an epoxy resin and a hardener.
Peristaltic pump	Gilson	Minipuls 3	
Peristaltic tube	Gilson	F117934	
Sodium hydroxide (NaOH)	Sigma-Aldrich	30620	
Nitric acid (HNO ₃)	J. T. Baker	959834	
Acrylamide (prop-2-enamide, C ₃ H ₅ NO)	Sigma-Aldrich	A8887	Acutely toxic and carcinogenic

In-house-built photomask	N/A	N/A	The in-house-built photomask was made of a black paper (114 mm (L) × 22 mm (W)) that contained an open window (94 mm (L) × 2 mm (W)) allowing the desired region
1,1-Dichloroethylene	Sigma–Aldrich	163032	Acutely toxic and carcinogenic
Cartridge	Dikma	ProElut AL-B	
2,2-Azobisisobutyronitrile (AIBN, C ₈ H ₁₂ N ₄)	Showa Chemical	0159-2130	
Ethanol	Sigma–Aldrich	32221	
Hexanes (C ₆ H ₁₄)	Millinckrodt Chemical	5189-08	
In-house-built irradiation system	Great Lighting (UV-A lamp)	N/A	An opaque box with an UV-A lamp (40 W, maximum emission at 365 nm)
Glass vial	Yeong Shin	132300019	Fragile
Aluminum foil	Diamond	N/A	
Conical tubes with screw caps	labcon	3181-345-008 (50 mL); 3131-345-008 (15 mL)	
Rocking shaker	TKS	RS-01	
Contact angle meter	First Ten Angstroms	FTA 125	
PMMA bead	Scientific Polymer Products	037A	
Mortar and pestle, agate	Yeong Shin	139000004	Fragile
Tissue culture plate	AdvanGene Life Science Plasticware	AGC-CP-24S-50EA	24-Well, non-treated, sterilized
Hydraulic press	Panchum	Press-200	
Laser ablation	New Wave Research	NWR193	
Inductively coupled plasma-mass spectrometer	Agilent Technologies	Agilent 7500a	
Glass bottle	DURAN	21801245 (100 mL); 21801365 (250 mL)	
Dispersive Raman spectrometer	Thermo Fisher Scientific	Nicolet Omega XR	
Manganese nitrate tetrahydrate (Mn(NO ₃) ₂ ×4H ₂ O)	Sigma–Aldrich	63547	
Maleic acid disodium salt hydrate (C ₄ H ₄ Na ₂ O ₅)	Sigma–Aldrich	M9009	
X-ray absorption near edge structure (XANES)	N/A	N/A	The Mn K-edge XANES analyses were conducted at 07A and 17C1 beamlines of the National Synchrotron Radiation Research Center (NSRRC) in Taiwan.