

Materials List for:

Characterization, Quantification and Compound-specific Isotopic Analysis of Pyrogenic Carbon Using Benzene Polycarboxylic Acids (BPCA)

Daniel B. Wiedemeier¹, Susan Q. Lang², Merle Gierga³, Samuel Abiven¹, Stefano M. Bernasconi³, Gretchen L. Früh-Green³, Irka Hajdas⁴, Ulrich M. Hanke¹, Michael D. Hilf¹, Cameron P. McIntyre⁴, Maximilian P. W. Scheider¹, Rienk H. Smittenberg⁵, Lukas Wacker⁴, Guido L. B. Wiesenberg¹, Michael W. I. Schmidt¹

¹Department of Geography, University of Zurich

²Department of Earth and Ocean Sciences, University of South Carolina

³Department of Earth Sciences, ETH Zurich

⁴Laboratory of Ion Beam Physics, ETH Zurich

⁵Department of Geological Sciences, Stockholm University

Correspondence to: Daniel B. Wiedemeier at daniel.wiedemeier@uzh.ch

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Materials

Name	Company	Catalog Number	Comments
ball mill	Retsch	N/A	ball mill with carbon-free grinding jars and balls (Retsch MM 200 with agate grinding jars and balls)
combustion oven	Nabertherm	N/A	combustion oven/muffle furnace with a temperature of 500 °C (Nabertherm L40/11 or similar)
pressure bombs with PTFE pressure chambers, quartz digestion tubes with quartz lids	Seif Aufschlusstechnik, Unterschleissheim, Germany	N/A	Helma U. Rudolf Seif Aufschlusstechnik Fastlingerring 67 85716 Unterschleissheim Germany Tel: (+49) 89 3108181
vortex mixer	common lab supply	N/A	
oven	Thermo Scientific	50051010	drying oven with constant temperature (Thermo Scientific Heraeus or similar)
vacuum manifold system with PTFE connectors	Machery Nagel	Chromabond 730151 730106	ftp://ftp.mn-net.com/english/Instruction_leaflets/Chromatography/SPE/CHROMABOND_VK_DE_EN.pdf
reusable glass syringes with disposable glass fibre filters	Machery Nagel	730172 730192	http://www.mn-net.com/SPEstart/SPEaccessories/EmptySPEcolumns/tabid/4285/language/en-US/Default.aspx
25 ml volumetric glass flasks	common lab supply	N/A	In contrast to all other glassware, do not combust to ensure volumetric accuracy. Instead, clean in acid bath, with ultrasound and with ultrapure water.
chromatographic glass columns with frit and PTFE stopcock and glass wool	custom made	N/A	dimensions of glass columns: ca. 40 cm long, ca. 1.5 cm in diameter
cation exchange resin	Sigma Aldrich	217514	Dowex 50 WX8 400
conductivity meter	WTW	300243	LF 320 Set
100 ml conical flasks for freeze drier	common lab supply	N/A	

liquid nitrogen	common lab equipment	N/A	for snap-freezing the aqueous solution after removal of cations
freeze dryer	Christ	N/A	Alpha 2 - 4 LD plus
C18 solid phase extraction cartridges	Supelco	52603-U	http://www.sigmaaldrich.com/catalog/product/supelco/52603u?lang=de&region=CH
2.5 ml glass test tubes	Agilent Technologies	5022-6534	http://www.chem.agilent.com/store/en_US/Prod-5022-6534/5022-6534?navAction=push&navCount=0
concentrator	Eppendorf	5305000.100	
1.5 ml HPLC autosampler vials	depending on HPLC	N/A	
6 ml fraction collector vials	depending on HPLC	N/A	
high purity N ₂ gas	common lab equipment	N/A	
12 ml borosilicate gas tight vials	Labco	538W	http://www.labco.co.uk/europe/gas.htm#doublewad12ml
needles	B Braun	4665643	http://www.bbBraun.ch/cps/rde/xchg/cw-bbraun-de-ch/hs.xsl/products.html?prid=PRID00000510
high purity He gas	common lab equipment	N/A	
HNO ₃ (65%) p.a.	Sigma Aldrich	84378	http://www.sigmaaldrich.com/catalog/product/sial/84378?lang=de&region=CH
2 M HCl	Sigma Aldrich	258148	mix with ultrapure water to achieve 2 M solution
2 M NaOH	Sigma Aldrich	71691	mix with ultrapure water to achieve 2 M solution
methanol	Sigma Aldrich	34860	http://www.sigmaaldrich.com/catalog/product/sial/34860?lang=de&region=CH
water	Milli-Q	Z00QSV0WW	Type 1 grade, optimized for low carbon
orthophosphoric acid	Sigma Aldrich	79606	http://www.sigmaaldrich.com/catalog/product/fluka/79606?lang=de&region=CH
acetonitrile	Sigma Aldrich	34851	http://www.sigmaaldrich.com/catalog/product/sial/34851?lang=de&region=CH
C18 reversed phase column	Agilent Technologies	685975-902	Agilent Poroshell 120 SB-C18 (4.6 x 100 mm)
Na ₂ S ₂ O ₈ , sodium persulfate	Sigma Aldrich	71890	http://www.sigmaaldrich.com/catalog/product/sial/71890?lang=de&region=CH
BPCA standards			
trimellitic acid	Sigma Aldrich	92119	http://www.sigmaaldrich.com/catalog/product/fluka/92119?lang=de&region=CH
hemimellitic acid	Sigma Aldrich	51520	http://www.sigmaaldrich.com/catalog/product/aldrich/51520?lang=de&region=CH
pyromellitic acid	Sigma Aldrich	83181	http://www.sigmaaldrich.com/catalog/search?term=83181&interface=All&N=0&mode=match%20partialmax&lang=de&region=CH&focus=product

benzenepentacarboxylic acid	Sigma Aldrich	S437107	http://www.sigmaaldrich.com/catalog/product/aldrich/s437107?lang=de&region=CH
mellitic acid	Sigma Aldrich	M2705	http://www.sigmaaldrich.com/catalog/product/aldrich/m2705?lang=de&region=CH
oxidation standards			
phtalic acid	Sigma-Aldrich	80010	http://www.sigmaaldrich.com/catalog/product/sial/80010?lang=de&region=CH
sucrose	Sigma-Aldrich	S7903	http://www.sigmaaldrich.com/catalog/product/sigma/s7903?lang=de&region=CH
black carbon reference materials	University of Zurich	N/A	http://www.geo.uzh.ch/en/units/physische-geographie-boden-biogeographie/services/black-carbon-reference-materials