

Materials List for:

# Temperature-programmed Deoxygenation of Acetic Acid on Molybdenum Carbide Catalysts

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## Materials

| Name                                  | Company                   | Catalog Number              | Comments                                                                                                                                                                                                                                            |
|---------------------------------------|---------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| glacial acetic acid                   | Cole-Parmer               | EW-88401-62                 | alternate supplier acceptable if ACS purity grade. See caution statement in protocol for safety information                                                                                                                                         |
| UHP He                                | Airgas                    | HE R300SS                   | alternate supplier acceptable if >99.99% purity                                                                                                                                                                                                     |
| UHP Ar                                | Arigas                    | AR R200                     | alternate supplier acceptable if >99.99% purity                                                                                                                                                                                                     |
| acetone                               | VWR International         | BDH1101-4LP                 | alternate supplier acceptable if >99.5% purity                                                                                                                                                                                                      |
| quartz chips                          | Powder Technology Inc.    | Crushed Quartz              | sieved 180-300 µm, calcined in air at 500 °C overnight                                                                                                                                                                                              |
| mass spectrometer - turbo vacuum pump | Pfeiffer Vacuum           | TSU 071                     | mass spectrometer is controlled with LabVIEW 2010 software package (National Instruments)                                                                                                                                                           |
| mass spectrometer - turbo vacuum pump | Stanford Research Systems | RGA100                      |                                                                                                                                                                                                                                                     |
| micro gas chromatograph               | Agilent                   | CP740388                    | 490 Micro GC; 4-channel system<br>Channel 1: 494001360 Molseive 10m, heated backflush<br>Channel 2: 494001460 PPU 10m, heated backflush<br>Channel 3: 490040 AL2O3/KCL 10+0.2m, heated backflush<br>SPECIAL<br>Channel 4: 492005750 5CB 15m, heated |
| GC software                           | Agilent                   | OpenLAB CDS EZChrom Edition |                                                                                                                                                                                                                                                     |
| clean gas filters                     | Agilent                   | CP17974                     | for use on GC carrier gases (He, Ar)                                                                                                                                                                                                                |
| quartz "U-tube" reactor               | n/a                       |                             | hand blown glass, custom built to order                                                                                                                                                                                                             |
| bubbler                               | n/a                       |                             | custom built to order                                                                                                                                                                                                                               |
| ceramic furnace                       | Watlow                    | discontinued                | Similar furnace part #: VC401J12A-B000R                                                                                                                                                                                                             |
| heat tape controller                  | n/a                       |                             | custom built with Watlow EZ-zone parts                                                                                                                                                                                                              |
| heat tape                             | Omega                     | FGH051-060                  | alternate supplier for extreme temperature heat tape acceptable                                                                                                                                                                                     |
| heat tape insulation                  | JEGS                      | 710-80809                   | alternate supplier acceptable                                                                                                                                                                                                                       |
| thermocouple                          | Omega                     | e.g., KMQSS-062U-18         | K-type thermocouples; alternate sizes may be required                                                                                                                                                                                               |

|                                              |             |                 |                                                                                                                                                 |
|----------------------------------------------|-------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| thermocouple O-ring                          | Swagelok    | VT-7-OR-001-1/2 | perfluoroelastomer(fluorocarbon FKM) O-ring                                                                                                     |
| 2 µm solids filter, VCR gasket               | Swagelok    | SS-4-VCR-2-2M   |                                                                                                                                                 |
| 1 µm orifice, VCR gasket                     | Lenox Laser | SS-4-VCR-2      | for mass spectrometer orifice                                                                                                                   |
| 316/316L stainless steel tubing and fittings | Swagelok    | Varies          | See Swagelok 'VCR Metal Gasket Face Seal Fittings' and 'Stainless Steel Seamless Tubing and Tube Support Systems' catalogs for more information |
| 316/316L stainless steel tubing and fittings | Swagelok    | Varies          | See Swagelok 'Integral-Bonnet Needle Valves', 'Bellows-Sealed Valves' and 'One-Piece Instrumentation Ball Valves' catalogs for more information |