#1 CONTACT INFORMATION:

<table>
<thead>
<tr>
<th>Procedure Title</th>
<th>Carbonizing Quartz Tubing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure Author</td>
<td>Noel Amaro</td>
</tr>
<tr>
<td>Date of Creation/Revision</td>
<td>13 February, 2015</td>
</tr>
<tr>
<td>Name of Responsible Person</td>
<td>Chong Zheng</td>
</tr>
<tr>
<td>Location of Procedure</td>
<td>La Tourette 330</td>
</tr>
<tr>
<td>Approval Signature</td>
<td></td>
</tr>
</tbody>
</table>

#2 THIS STANDARD OPERATING PROCEDURE (SOP) IS FOR A:

- [ ] Specific laboratory procedure or experiment
- [x] Generic laboratory procedure that covers several chemicals
- [ ] Generic use of specific chemical or class of chemicals with similar hazards

#3 PROCESS OR EXPERIMENT DESCRIPTION

In order to prevent quartz tubing from reacting with metals during high temperature reactions, a thin layer of a carbon coating is applied to the inside wall of the tube where the reaction is expected to take place. This is accomplished by adding a small volume of acetone to the inside of a quartz tube, swirling the acetone to coat the inside of the tube, dumping excess acetone into a waste beaker, then using an oxygen/natural gas flame to burn the acetone into a solid coating.

Frequency:

- [x] other: As needed
- [ ] one time
- [ ] daily
- [ ] weekly
- [ ] monthly

Duration per Expt:

- 5-10 minutes
SAFETY LITERATURE REVIEW & HAZARD SUMMARY

Review SDS for acetone. Read instruction manual of how to use blow torch properly. While handling quartz tubing, do not grip or apply pressures that can cause shattering. While heating the quartz tubing, grip a safe distance from the area that is being heated wearing heat-resistant gloves. Do not set heated quartz tubing anywhere except heat-resistant ceramic test tube mounts designed for holding high-temperature quartz tubing.

STORAGE REQUIREMENTS

Keep acetone in Flammable Cabinet.

STEP-BY-STEP OPERATING PROCEDURE

Steps to include in your procedure:

1. Don personal protective equipment.
   ✓ appropriate street clothing (long pants, close-toed shoes)
   ✓ gloves; indicate type: Heat Resistant Gloves
   ✓ safety goggles  ✓ safety glasses  ✓ face shield
   ✓ lab coats
   □ other:

2. Check the location and accessibility of the safety equipment that serves your lab:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Fume</td>
<td>Location: La Tourette Rm 330</td>
</tr>
<tr>
<td>Hood/Glove Box or other Ventilation Control</td>
<td>Location: La Tourette Rm 330/Outside Rm 330</td>
</tr>
<tr>
<td>Eyewash/Safety Shower</td>
<td>Location: La Tourette Rm 330/Outside Rm 330</td>
</tr>
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</table>

3. Dispense 2-3ml of acetone in quartz tubing. Rotate tubing to spread acetone along the inner wall of the quartz tubing. Pour acetone into waste beaker.
4. Open the oxygen tank and natural gas line. The oxygen should be at about 20 psi. Use a grill lighter or long match to light the torch. Adjust the flow rates of the oxygen and natural gas to produce a blue cone flame by twisting the knobs on the torch, green for oxygen, red for natural gas.

5. Start to heat quartz tubing to carbonize the acetone inside the tube. Make sure the flame is always pointed in a safe direction, and never at anyone or anything flammable or hazardous. Heat the desired area of the tube until it is red hot. When sufficiently heated a black coating will coat the inside of the tube. Typically, only the portion of the quartz tubing where the chemical reaction will happen needs to be carbonized.

6. Twist the flow rate knobs closed to turn off the flame. Close the gas line and oxygen tank. Set the heated quartz tubing into the heat-resistant ceramic test tube mounts designed for holding high-temperature quartz tubing.

5. Dispose of excess acetone from waste beaker into ‘Organic Waste’ container.

6. Clean up work area and lab equipment.

7. Remove PPE, except street clothing, and wash hands.

### WASTE DISPOSAL

Dispose of excess acetone into ‘Organic Waste’ container.

### TRAINING REQUIREMENTS

#### General Training (check all that apply):
- [x] General Safety & Emergency Preparedness
- [x] Chemical Safety for Laboratories
- [ ] Radiation Safety
- [ ] Biosafety training
- [ ] Other:________________________

#### Location Where Records Maintained:

#### Laboratory-specific training (check all that apply):
- [x] Review of SDS for other chemicals involved in process/experiment
- [x] Review of this SOP
- [ ] Other:________________________
<table>
<thead>
<tr>
<th>Location Where Records Maintained:</th>
<th>Departmental website and LaTourette 330</th>
</tr>
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<tbody>
<tr>
<td>#9 PRIOR APPROVALS</td>
<td></td>
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