**Teflon Pipe ETC Chamber Design**

Last modified by Katherine Holzem (laboratory of Igor Efimov, PhD, Washington University in St. Louis) 5.19.14



**Chamber Supplies:**

## Teflon Pipe:

## Tube Made of Teflon® PTFE, 1-7/8" OD x 1-1/2" ID

McMaster-Carr Cat No. 8547K36

Cut into 3” segments

**Pipe-end Caps:**

## Clamp-Tight Pipe-End Caps

McMaster-Carr Cat No. 2394K11

**Banana Plug Sockets (Black and Red):**

## Post, Binding; Screw; 15 A; 1000 VAC; Brass; Nylon; Black; #6-32;

## Post, Binding; Screw; 15 A; 1000 VAC; Brass; Nylon; Red; #6-32;

Allied Electronics Cat No. 70183190 (Black), 70183189 (Red)

**Barbed Tube Fittings:**

## Durable Nylon Tight-Seal Barbed Tube Fitting Straight for 1/4" Tube ID X 1/8 Male Pipe, Black

McMaster-Carr Cat No. 5463K245

**Non-conductive mesh:**

## Stretchable Molded Plastic Mesh Chemical-Resistant Polypropylene 15 x 11

McMaster-Carr Cat No. 9265T51

**Platinum or Pt-IR (90-10) wire**

**3D printed electrode supports (ABS Material)**

**Chamber Assembly:**

Preparation Steps:

 1) Cut Teflon pipe to 3” length pieces.

2) Drill holes in pipe for tube fittings (approximately 120° apart, in the middle of the pipe length). Epoxy in tube fittings.



3) Drill depression in metal binding post (on the opposite side from banana socket; makes it easier to solder on wire)

4) Solder wire to binding post

5) Poke holes in the center of each pipe-end cap (can be done with a large IV needle)

6) 3D print electrode support components

I typically have our machine shop help with preparation steps 1-3, and 5. Their tools are much better suited than what we have around the lab.

Assembly Steps:

 1) Once the wire is soldered, it can be fed through the hole in the pipe-end cap.



2) Feed the bottom part of the electrode support onto wire, then curl wire around guide posts.



 3) Glue non-conductive mesh to top electrode support (as shown above).

 4) Attach top electrode support, by fitting top and bottom ridges and turning counterclockwise.



 5) Repeat steps 1-4 for other end-cap.

6) Can now put end-caps on teflon pipe, and use screws to tighten down. The pipe should have enough inner tolerance for the electrode support.

