Appendix III. SOP for Metal Assisted Chemical Etching (MACE)

1. Deposit metal catalyst layers using the AJA e-beam evaporator
    a. First layer: 60 nm Ag (evaporation rate: 0.1 nm/s).
    b. Second layer: 20 nm Au (evaporation rate: 0.1 nm/s).
2. Metal layer lift off:
    a. Nano imprint lithography: sonicate in DMF for 20 min.
    b. Photo lithography: dip in Shipley 1165 for 20 min and then sonicate for 10 s. Rinse with IPA and dry with N_2 after the lift off.
3. Place the metal coated Si wafer piece (~ 1 cm * 1 cm) in a 2% HF solution for 1 minute to improve the direct Ag/Si adhesion. Do this step immediate before step 3
4. Transport the samples directly from the 2% HF solution to a MACE solution composed of 4.8 M HF and 0.3 M H_2O_2 (typically 30 mL of total volume) to etch the SiNWs at room temperature to the desired length. (etch rate: ~ 0.2-0.3 μm/min)
5. After MACE etching, soak the sample in IPA.
6. Dry the sample with critical point dryer to prevent agglomeration.