Pumping and holding test procedure for Aixtron MOCVD system

This teaching module describes the pumping and holding test in the Aixtron 200/4 RF SS MOCVD system.

- ***Preparation***
  1. Make sure system is in standby mode.
  2. Close all the bubbler manual valves. Close inlet manual valve first to do not increase of pressure in the bubbler from inlet side. Then, close outlet manual valve.

- ***Pumping test***
  3. Open 'vent valve' to pump the vent line.
  4. Click 'control' on the control screen so that chamber pressure can be manually controlled using the control screen.
  5. Close all N_2 and H_2 input isolation pneumatic valves.
  6. Set all the MFC values to 90% and all PC values to zero, so that they are fully opened.
  7. Reduce growth chamber pressure manually and gradually from 1000 mbar to 0 mbar. Don't make any abrupt change of pressure (For example, 1000 → 300 mbar: use steps of 30 mbar, 200 → 100 mbar: use steps of 20 mbar, 100 → 0 mbar: use steps of 10 mbar)
  8. Click 'parameters' on the control screen to control the position of the throttle valve by MKS pressure controller.
  9. Push 'Open' in the MKS pressure controller to fully open the throttle valve (100%).
  10. Read and record pressure 5 minutes after the throttle value has been fully opened. The pressure should be as low as possible. (January 2007 check up: 3.3 mbar on MKS pressure controller and 3.4 mbar on control screen)
  11. If the pressure is high (>10 mbar), the system has a problem.

- ***Holding test***
  12. After pumping test, push 'close' on the MKS pressure controller to close the throttle valve (0%). Now, the reactor is in isolation status.
  13. Read and record pressure on the control screen and MKS pressure controller in every five minutes for 30 minutes. (January 2007 check-up: initial pressure was 3.3 mbar, final pressure after 30 min was 3.4 mbar on the MKS pressure controller, initial pressure was 3.4 mbar, final pressure was 3.5 mbar on the control screen)

- ***System back on***
  14. After holding test, click 'parameters' on the control screen. You will see the throttle value opening.
  15. Open one N_2 input isolation pneumatic valve then, you will see the throttle valve opening. Do not open all input isolation pneumatic valves at the same time. This would cause overload in the pump.
  16. Then, increase the pressure gradually by using same small pressure steps used in Step 7 until the position of the throttle value is stable.
  17. Repeat Step 15 and 16 until a pressure is reached 1000 mbar.
  18. Return all the N_2 and H_2 input isolation pneumatic valves to the default values.
  19. Return all the MFCs and PCs to the default values.
  20. Close vent valve.
  21. Click 'control' on the control screen.