INDIAN INSTITUTE OF TECHNOLOGY KANPUR
DEPARTMENT OF CHEMICAL ENGINEERING
PG Research lab

STANDARD OPERATING PROCEDURE
ION CHROMATOGRAPHY

IMPORTANT NOTES:

- **Never use Mobile phase without filtering**
- **Mobile phase should not be older than 5 days.**
- **Never inject sample without filtering**
- **When you are not using the system for long time (more than a week), rinse whole system with UPW (Ultra-Pure Water) using dummy connecter (Without Guard Column and main Column). - perform by Engineer**

1. Machine Start-up procedure

1.1. Switch on the UPS by pressing **ON** button with middle button.
1.2. Switch on the Anion channel & cation channel from back switch.
1.3. Switch on the auto-sampler using **RED STOP** button.
1.4. Switch on PC.
1.5. Start the software **MagIC Net 4.2**.
1.6. Click on configuration and check if status is ok in all the parts.
1.7. Open purge valve in anti-clockwise direction in both the channels and place petri-dish below purge valve outlet.
1.8. Now go to manual controls and start the pump with flow rate of 0.7ml/minute for anion channel (**Eco IC 1**) and 0.9ml/minute for cation channel (**Eco IC 2**).
1.9. Check if liquid flow is coming out of all the outlet pipes.
1.10. If liquid flow is not proper from any of the outlet, check for any air trapped within the system.
1.11. Wait for 10 minutes to clean-out the system.
1.12. Stop the pump & purging after 10 minutes.
1.13. Close purge valve in clockwise direction in both the channels.
1.14. Click on **WORKPLACE**
1.15. Click on **Equilibration** tab.

1.16. Start Hardware by clicking on **START HW** and wait until three smooth peaks appear in anion graph & straight line in cation graph.

1.17. Note: EcoIC-1 pressure should note be exceeded beyond 24MPa & EcoIC-2 pressure should note be exceeded beyond 19MPa.

1.18. Now machine is ready for Sample/Standard run.

2. Sample Analysis:

2.1. Click on **Determination series** tab.

2.2. Double Click on first blank line in the table and sample detail pop-up will appear. Fill sample details & click on apply.

2.3. Place the sample vial in the Rack position and ultrapure water in +1 position

2.4. Repeat Step 2 and 3 for all the samples.

2.5. Click on start button. Wait until all the sample are analyzed (Approx. time 30min\sample).

3. Results

3.1. Click on **database**.

3.2. Select the sample name in the table.

3.3. Click on Tools > Repost Template > Open. Click on **Pdf** symbol.

3.4. Result file will be opened.

3.5. Save this file & deliver it to the user.

4. Removal of Invalid Peaks

4.1. Go to **Database** Tab.

4.2. Select the Sample to corrected.

4.3. Select & Right Click on the sample & click on **Reprocessing**.

4.4. Zoom on the peak to be removed.

4.5. Right click on the peak and click on remove peak.

4.6. Remove all the unwanted peaks.

4.7. Click on **Reprocessing** & select the option "**Apply calibration from selected determination to all determination**" then click on **OK.**

4.8. Click on **OK**.

5. Strength of Mobile phase & Suppressor solution

5.1. Anion Mobile phase – [**8 MilliMolar Na_2CO_3 + 0.25 MilliMolar $NaHCO_3$ + 5% Acetonitrile (CH_3CN)**]/Liter

5.2. Cation Mobile phase – [**1.7 MilliMolar HNO_3 + 1.7 Dipicolinic acid**]/Liter

5.3. Suppressor Solution – [**50 Millimolar H_2SO_4**]/Liter

6. Shut Down of Instrument:

6.1. Click on **Workplace**> Go to the **Equilibration**>Click on **STOP HW**.

6.2. Close the Software **MagIC Net 4.2**

6.3. **Red Stop** the Autosampler with long press stop button.

6.4. Switch of the instrument switches in rear side of the both instruments.

6.5. Switch off the UPS.