NexION ICP-MS Instrument Procedure

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Daily Instrument Maintenance and Start-up Procedure

1. Check that Ar valves are opened at tanks. Check tank levels.
   - Tanks need to maintain a pressure of 100PSI or greater to maintain instrument plasma. The pressure regulator valve can be opened to more rapidly increase tank pressure when necessary.
2. Empty 20L waste container.
3. Fill 20L rinse container with rinse solution.
   - Rinse solution (prepared in 8L bottles):
     1. 8L Ultra-pure water
     2. 400μl Triton X-100 surfactant
     3. 160ml HNO_3

Cones, torch, injector maintenance

1. Open instrument
   1. Open hood and prop open with handle.
   2. Press button on front of instrument to unlatch door.
2. Use a flashlight to inspect the torch for any melted or burned areas.
   - If present torch needs to be replaced.
3. Inspect injector for clogs or wear.
4. Inspect and clean clones.
   - Use cone removal tool to unscrew cones and wash tips in a 5% nitric acid solution being careful not to get solution on O-rings.
   - If O-rings are cracked or torn, replace.
   - **Thoroughly** dry before putting back into instrument.
5. Check tubing in peripump connecting drain line from spray chamber to waste container for tears or cracks, replace as necessary with MPP Santoprene Tubing, 1.52mm, yellow-blue.
6. Check fill level on prepFAST diluent and internal standard containers. Refill when necessary following the procedure in 'Refilling prepFAST diluent and internal standard containers' section
   - A line has been marked on each container, if liquid level in either container is lower than this line, it is time to remake the solution because the next run will run out of liquid.
7. Light plasma and let warm up for at least 30 minutes.

Optimization

1. Make sure Smart Tune solution is in autosampler position 4 and opened.
2. Run Smart Tune daily. These can be run one at a time or in batch.
   1. Look at the results of each step and make sure they haven't changed drastically from the day before. Large day-to-day changes indicate something isn't functioning properly.
   2. Check the Daily Performance Check stats. Make sure they are at an acceptable level.
3. If results are not acceptable, check tubing, check for air in syringes, turn of plasma, check and reseat cones.

Start Run

1. Assign dataset file: Dataset button>File>New>enter filename (e.g. YYMMDDpX, pY)
2. Open Method: Method button>File>Open>“qaupcd”>open
3. Assign sample file:
    1. Sample button>File>Open>select desired file (Usually ‘prepFAST 576 6-tray run, 5x dil’)
4. Batch tab>verify method (qaupcd.mth)

Refilling prepFAST diluent and internal standard containers

1. Refill diluent container with ultra-pure water.
2. Internal Standard container:
    1. Fill 2/3rds with UPW.
    2. Add 60ml analytical grade isopropyl alchohol
    3. Add 20μl 1000ppb Yttrium internal standard
    4. Add 50ml HNO_3
    5. Fill to top with UPW.
3. After refilling either container, the syringes need to be flushed and refilled.
    - **Note**: Plasma should not be lit for this procedure.
    1. To prevent overflow into the spray chamber, unscrew the nebulizer tubing at the red nut just before the nebulizer and put free end into a beaker.
    2. In the ESI-SC software select ‘Syringe Fill Prime’, this will run for about 10 minutes.
        - Syringes will flush several times, watch to make sure air bubbles are being discharged from the syringe and refilled with only liquid.
    3. Reconnect nebulizer.