

# 260-L LAr System Progress Report

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# Lab Safety and Space Management

- Please pay attention to the recent ES&H electrical safety message from safety
  - Severe electrical event that occurred at SLAC in December and ended with a life altering injury.
  - Overheating Wires Found During LOTO Implementation
  - Workplace Safety is always the priority at BNL
- **Safety review for Xenon extraction for PIONEER test**
  - Previous sample extraction is covered in our ESR as part of standard compressed gas handling
  - Batch transfer of all the Xenon in 14pcs detectors into a single storage cylinder is a non-standard procedure. A safety review is required
  - Reached out to lab safety to initiate the safety process
  - Currently looking for storage cylinders
  - Shipping needs to be in compliance with BNL rules, DOT rules and Switzerland regulations

# Xenon Purity Results

## ► Purity analysis

- Atlantic Analytical Laboratory, LLC run the component analysis on the sample for all major impurities including
  - H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, Ar, Kr, He, H<sub>2</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>
  - Analysis conducted with mass spectrometer, Fourier-transform infrared (FTIR) spectroscopy, and Electrolytic Hygrometry techniques

## ► Results

- Xenon purity is 99.89%, with 0.109% H<sub>2</sub> and 28 ppm of H<sub>2</sub>O
- No other impurities detected
- Gas purity well maintained after long-term storage, agrees with the specification
- Next is to make batch transfer and shipment to PSI

### Xenon Analysis Report

<u>Test Description/Units</u>	<u>Result</u>	<u>DL</u>
Nitrogen (N <sub>2</sub> , ppm v/v by MS):	nd	4
Oxygen (O <sub>2</sub> , ppm v/v by MS):	nd	4
Argon (Ar, ppm v/v by MS):	nd	4
Krypton (Kr, ppm v/v by MS):	nd	4
Helium (He, ppm v/v by MS):	nd	10
Hydrogen (H <sub>2</sub> , ppm v/v by MS):	1090	10
Carbon Monoxide (CO, ppm v/v by IR):	nd	0.5
Carbon Dioxide (CO <sub>2</sub> , ppm v/v by IR):	nd	0.5
Methane (CH <sub>4</sub> , ppm v/v by IR):	nd	0.5
Nitrous Oxide (N <sub>2</sub> O, ppm v/v by IR):	nd	0.5
Sulfur Hexafluoride (SF <sub>6</sub> , ppm v/v by IR):	nd	0.5
Water (H <sub>2</sub> O, ppm v/v by EH):	28	1
<b>Xenon (Xe, % v/v by difference):</b>	<b>99.89</b>	<b>na</b>

# 260-L System 2nd purity run

## ► Insulation of the inline filter

- Cryo-lite insulation wrapped on the inline filter cylinder
- Tried to start the activation process and found
  - Thermocouple lead broken and lost contact with the surfaces
  - All thermocouples are to be replaced to avoid future issues
  - Will start at the activation tomorrow with the thermocouple replacement and insulation wrapping
- Check with the plan: [https://docs.google.com/document/d/14GnwKKO2w51nc-pjVz\\_HpPn-AMeLpFyGILf3rRBCh5U/edit#](https://docs.google.com/document/d/14GnwKKO2w51nc-pjVz_HpPn-AMeLpFyGILf3rRBCh5U/edit#)



# Procurements and Misc.

- Tool cart for leak detector received
- Leak detector is expected to be shipped out from the vendor next week
- Vacuum ion-gauge replacement
  - Quoted for a new gauge controller
- Many feedthrus received from Aleksey

