Collecting Gas Samples with LP Tanks and a 12 V Pump

For Tritium Radioisotope Analysis of Methane

Setup

1. Remove the foam packing from the case and attach the line with the water trap to the inlet of the pump station using the quick-disconnect.
2. Attach the power cord to a 12 V power outlet in the field vehicle OR a 12 V battery (like a car battery). An extension cord is provided, but using it may decrease the pumping speed.

Purging the System

3. Attach the inlet tubing to the monitoring probe or extraction well. Extend the outlet line outside of the case and point it away (downwind) from the case.

If combustible gases are pumped into the pump case, they could be ignited by the pump.

4. Open the rate control valve on the pump station approximately 1/8 turn, and turn on the pump switch.
5. Monitor the vacuum on the inlet.
   - Some drop in pressure is normal if sampling a monitoring probe constructed with small tubing.
   - If vacuum increases rapidly or exceeds about 10 inHg, it generally indicates the well or tubing is filled with water. If this occurs, immediately decrease the pumping rate by partially closing the rate control valve. If a significant vacuum is still observed on the inlet (more than 5 inHg), turn off the pump to avoid drawing water into the system.
6. If less than 5 inHg of vacuum is observed, the rate control valve can be opened another full turn, which will provide full pumping rate.
7. Purge the tubing and lines for enough time to remove the gas in the bore of the probe or well, if possible.

Sampling

8. Remove the plastic cap from an unused LP tank. DO NOT OPEN THE VALVE ON THE TANK – it is evacuated, and opening the valve will fill it with air that will contaminate the sample.
9. With the pump running, loosely attach the outlet line so the threads just catch. LEAVE THE VALVE CLOSED and push the fitting against the seat until a pressure increase on the outlet gauge is observed, then release. Repeat this several times to purge air from the dead volume in the valve.
10. Note that the threads on these tanks are reversed – turn counterclockwise to tighten.
11. After purging the valve, tighten the fitting down finger-tight or just past. It shouldn't be necessary to use a wrench on the fitting because the seat is equipped with a rubber o-ring.
12. Slowly open the valve to begin collecting the sample. Because the tank is evacuated, the sample will initially be pulled into the tank very quickly, likely at a rate much faster than the pump speed. If you suspect there is water in the well, take care to slow the flow during this stage so that water is not drawn into the pump or tank. Use the control valve on the pump to slow the flow if necessary until the tank reaches atmospheric pressure.
13. Continue pumping sample gas into the tank until the pressure reaches at least 20 psig.
14. When sampling is complete, close the tank valve, and then turn off the pump. Disconnect the tank from the tubing and replace the plastic cover over the valve.
15. Record the sample name or well identifier, cylinder pressure, date, and time on the sample tag, and also record this information on a chain-of-custody form (one is included with your sampling kit, and a printable and fillable version can be found at isotechlabs.com).
16. Return the filled tanks to Isotech for analysis, following the packing and shipping instructions included with your sampling kit.

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