

# Liquid to Gas Homogenizer for Gas Sampling Valves May 2009

**Permits representative sampling of mixed liquids using a gas sampling valve instead of a liquid sampling valve.**

Liquid sampling valves (LSV) are commonly used to inject liquid samples ( 1-3ul ) into a gas chromatograph for analysis, but are more difficult to use than gas sampling valves( GSV ). The liquid sample is often something like LNG, propane, butanes, or Freon refrigerants which are very volatile and will only stay liquid under pressure. This makes it difficult to keep the sample a liquid for the period of time it takes to load the liquid sampling valve and then perform the injection. If the sample begins to gasify while in the loop of the LSV the sample size ( number of sample molecules ) injected will be less than if the sample remained a liquid. Typically, the GC operator would have to flow the liquid sample through the LSV until the sample flow came through the valve as a liquid, then shut off a valve to trap the liquid sample in the valve loop under pressure. Then make the injection. This procedure takes time and practice to become proficient.

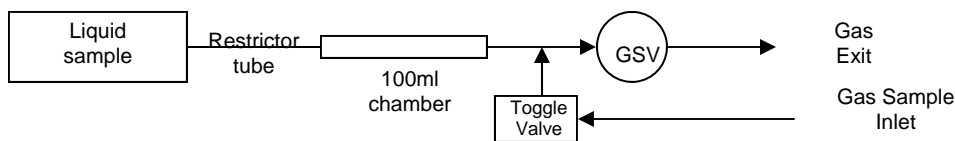
The reason LSVs have been the preferred method in the past is that samples which contain a mixture of compounds which have different boiling points do not always vaporize equally so taking a gas sample from an aliquot of liquid does not yield a representative concentration. That is, the gas does not contain the same concentration of molecules as the liquid.

SRI has developed a device we call a Homogenizer which allows the use of a gas sampling valve ( GSV ) instead of a LSV when sampling liquids. The homogenizer consists of a heated stainless steel chamber ( approximately 100 ml volume ) and a flow restrictor. The parts are mounted in the valve oven of a SRI 8610C GC.

The liquid sample is connected to the inlet fitting on the GC. The liquid sample flows through the restrictor tube at some rate ( about 50ul/min of liquid ) pushed by the pressure of the liquid. When the liquid reaches the heated 100ml chamber it flashes to a gas expanding by a factor of about 1000 in volume as it goes from liquid to gas.

After several minutes of continuous liquid to gas expansion, the gas in the 100ml chamber is present in exactly the same proportion as the molecules in the liquid.

The 100ml chamber exhausts to the exit fitting through the loop of a GSV. After two or three minutes of liquid to gas expansion the GC analysis is started and the GSV is actuated to inject the gas into the GC for analysis.



Using the GSV is much simpler for the operator than the LSV and may result in improved overall precision and accuracy.

## **8690-LPGH Homogenizer Accessory**

**\$495.00**

Restrictor and 100ml chamber mounted in GC valve oven plus toggle valve for using the same system with a gas sample.