A silicone loop can be added to any 8610C SRI GC as long as there is a place for the 10port valve which is required. A multiple Gas #5 GC configuration is shown in the photo.

In this GC there are three 10 port valves in the heated valve oven.

The front panel oven of the valve oven is easily disconnected by removing six 5/32” hex head screws.
Silicone Tube Loop
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Ideally the 3rd valve will be located at the front where the loop connections (ports 3 and 10) are easiest to get to.

Feed the silicone loop through the front plate and attach to ports 3 and 10 of the valve. If there is a regular loop already attached to those ports you will need to remove it in order to attach the silicone tube loop.

The silicone loop consists of two 1/16” stainless steel tubes with a short section of silicone tubing attached to the ends. The stainless tubing is .010 diameter to minimize the volume of the stainless tubing. .010” tubing has a volume of about 1.3ul/inch so two 24” long stainless tubes have a total volume of about 64 ul
The ends of the stainless tubing are epoxied to a plastic barb fitting. These fittings are commonly available in various plastics or metals. Silicone tubing is attached to the barb fittings.

The tube shown here is 12 inches long and has an internal diameter of .058 which has a volume of 43ul/inch for a total of 516 ul. Longer or shorter tubing can be substituted as desired.

The silicone part of the loop is inserted into the liquid to be measured.
The silicone tubing can be any size or wall thickness, but we have used this which was available on-line.

The valve diagram shows how Valve3 either isolates the loop (no gas flow) or places the loop in the flow path of valve2.

As the silicone loop sits in the liquid many of the compounds in the liquid will permeate through the silicone wall into the interior of the loop. When valve2 rotates and then Valve3 also rotates, whatever is in the silicone loop is pushed into the column.

Valve 3 is rotated back to the Load position (loop isolated) after a few seconds to avoid a detector signal shift which occurs if the carrier gas continues to extract the loop after it is initially emptied.

Ports 1 and 2 of Valve3 are plugged with 1 inch of .010 tubing so silicone tube is vented to atmospheric pressure when in the LOAD position.
As an example, the silicone tube loop (MultipleGAs#5 GC with TCD and FIDmethanizer) was alternately immersed in 10% methanol/water mix and clean water. This is the chromatogram of the methanol. You can see some small CO2 peak in the beginning also.

These are the operating conditions.

The most important point is that the analysis has be a repetitive sequence exposing the silicone tube to the sample for a constant amount of time each run.

In this case the runtime was 3.9 minutes and the Postrun Delay before re-starting was .1 minutes. So there was a 4 minute cycle.

The results of many sequential runs were automatically added to the log file which is shown on the next page.
Here is the log file which shows the data from each run as the sample was switched from 10% Methanol/Water to Clean Water and then back again to 10% Methanol/Water.

Note the Relative Standard Deviation ( %RSD ) for the first 7 runs was 1.27%.

Also note how the silicone tube takes several runs to equilibrate to the new sample. This may take longer with more viscous fluids or other target molecules.

For this reason, you have to sample on some repeated interval so the sample has the same amount of time every time to permeate through the wall of the silicone tubing.