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AUTOMATED SEQUENCES FOR STANDARD GAS INJECTIONS

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Injecting gas standards in an accurate and repeatable way, with optimized operator time and gas consumption is now possible thanks to GasMix™.

Almost all laboratory analyzers are nowadays automatically controlled through a microcomputer-based process. The operator just needs to select the appropriate method and the different parameters (settings, injection, acquisition, automatic operation, etc.) are recalled. Then the user prepares his samples and enters their ID according to the desired sequence. At the end of the analysis sequence, the only thing to do is to compile the results, if this step is not automatic.

There are numerous advantages with automatic procedures: workload decreases. Injections are more repeatable, and so are the results.

However, this kind of automated sequence does not exist for gas injection … unless one has a GasMix™ !
Gas Mix brings gas analysis at the same level as the other laboratory analyzers.

Injection of a gas

Injecting a gas requires an operator who must :
. connect the cylinder to the injection valve,
. open the cylinder at a "low" pressure,
. allow the gas to flow through over a certain amount of time to fully purge the sample loop,
. close the gas cylinder,
. wait until the sample loop equilibrates to atmospheric pressure,
. turn the valve and/or launch the instrument,
. wait for the end of the analysis,
. renew all operations as many times as needed,
. look at the results.

GasMix™ is controlled via a dedicated software, and allows you to automate all these operations and even to run them automatically through a previously defined sequence.
This way the operator just connects the cylinder on GasMix™, sets up the input pressure, creates and/or launches his sequence and comes back when the sequence is done to look at the results.

Operating conditions

Below is an example of a gas cylinder, filled with 15 ppm mol/mol of tetrahydro-thiophene in methane, which will used to calibrate a sulfur detector for natural gas.

This cylinder is connected to the channel 1 of GasMix. On the Channel 1, there is a mass flow controller 1 – 50 mL/min, calibrated for this specific gas.

The user sets up the length of operations thanks to the software:
.   the time the gas takes to flow through the sample loop is controlled by the purge time. This time is carefully chosen to let the gas circulate long enough to wipe the traces of a former injection, and therefore avoid cross contamination, but not too long to control the standard gas consumption.
.   the analysis time is also adjustable. At the end of the total cycle time, another cycle is launched.

The purge of the sample loop is set up to 1min and 15s. During that time, the MFCs open their valve to the desired flows.

For this example, the analysis is a chromatographic separation of 15 minutes and 3 more minutes are needed for equilibrium before the following analysis. So the analysis time is set to 20min. During that time, GasMix™ is on stand-by.

Then, the user creates his sequence, launches it and dedicates his time to other tasks.

Three successive injections will be performed without any attendance from the operator.