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Development of an on-line GC using existing retired equipment

Yuhui Henry Zhao
Epcor Water Service Inc, Canada

Abstract

To ensure drinking water quality, continuously monitoring the volatile organic compounds in the source water and the treated water is very important for any water treatment plant. On-line, real time information will be crucial to the Engineers and operators. For volatile organic compounds analysis, gas chromatography (GC) is one of the best choices to carry out this task, due to its high sensitivity and selectivity. As a result, an in-house on line GC System was developed for this purpose. It includes the following parts:

a. A stream selection device to connect and monitor the source water and treated water using one instrument;

b. A self-cleaning filter to remove sands and suspended solids from the source water before it is introduced into the sample concentrator;

c. A Purge and Trap (P&T) device (from Tekmar) to extract and concentrate the volatile compounds before the compounds being injected onto the GC column. Since GC is a gaseous device and analytes introduced into the GC must be in a volatile format, either in volatile organic solvent or in gaseous state.

d. A GC (from Hewlett-Packard) equipped with a Flame Ionization Detector (FID).

e. A computer with Windows xp and ChemStation to control the sampling valves through a DAQ (from National Instruments) and to control the GC and P&T through a GPIB-USB interface (from Agilent).

To control cost, in the development of this system, the GC and P&T are retired from regular use but still in good working condition.

Biography

Yuhui (Henry) Zhao completed his PhD in Analytical Chemistry from the University of Alberta in 1995. He has been working since in a few analytical laboratories for the past 20 years as a Senior Scientist. His research and development interests cover the areas of Inductively Coupled Plasma (ICP) - Optical Emission Spectroscopy, ICP-Mass Spectrometry, GC and GC-Mass Spectrometry. Yuhui is currently working as a QA Scientist at Epcor Water Service Inc., Edmonton, Alberta, Canada.