

Measurement of TOC in Bottled Mineral Water and Raw Water by TOC

Water is used in large quantities to manufacture soft drinks, bottled mineral water, beer and other drinks. The quality of the raw water has a major influence on the quality of the manufactured products. It is stipulated in relevant standards that the water used in food products shall be "suitable for drinking."⁽¹⁾ If drinking water is used as the raw water it is not required to check the water quality because drinking water is already recognized as "suitable for drinking." Manufacturers of food products are checking and controlling the quality of the raw material water as part of quality control of their products or operation control of their production processes (as part of quality assurance in case of ISO9001 accredited manufacturers).

The water quality standard of the Japanese Water

Works Law was revised in April 2005. The revision specifies that the content of total organic carbon (TOC), not the potassium permanganate consumption, shall be used to determine the quantity of organic substances in drinking water. Now the measurement of organic substances in raw water and drink products can be done using TOC analyzer in accordance with the Japanese Water Works Law provision.

Here we introduce an example of using the Total Organic Carbon Analyzer TOC-VcSH to analyze bottled mineral water and raw water (well water).

(1) According to standards governing food products and additives (Japanese Ministry of Health and Welfare Notification No. 370, issued December 28, 1959.)

■ Measuring Method

The samples used were two types of mineral water sold in polyethylene terephthalate bottles, and raw water from a well. These samples were analyzed using Shimadzu Total Organic Carbon Analyzer TOC-VcSH. The analyzer was calibrated and the calibration curve was created using 0mgC/L and 1mgC/L (carbon concentration 1mg/L) of potassium hydrogen phthalate standard solutions. Fig.1 shows the calibration curve. The calibration curve was corrected by shifting it to the origin to eliminate the effect of carbon contained in the pure water used for preparing the standard solutions.

<Analytical Conditions>

Analyzer : Shimadzu Total Organic Carbon Analyzer
TOC-VcSH
Measured item : TOC(TOC by acidification and sparging method)

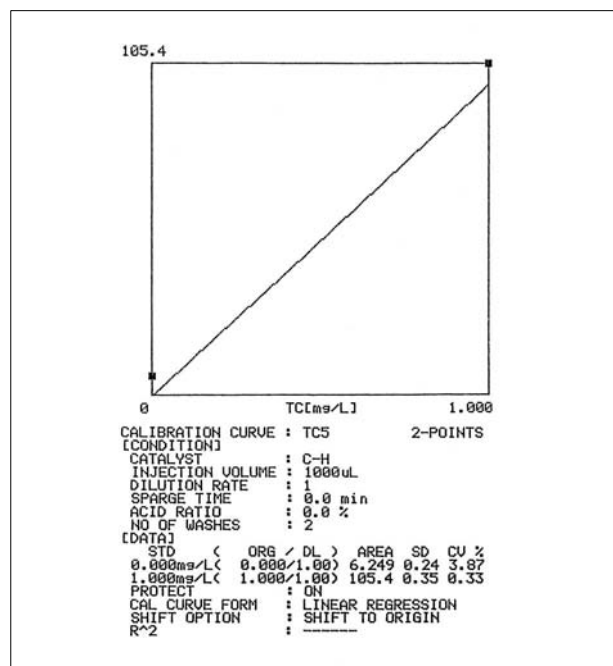


Fig.1 Calibration Curve

■ FYgi `lg

The TOC measurement results of the two types of bottled mineral water and the raw water (well water) are shown in Table 1 and Fig.2. The Water Works Law specifies that the organic substance (the total organic

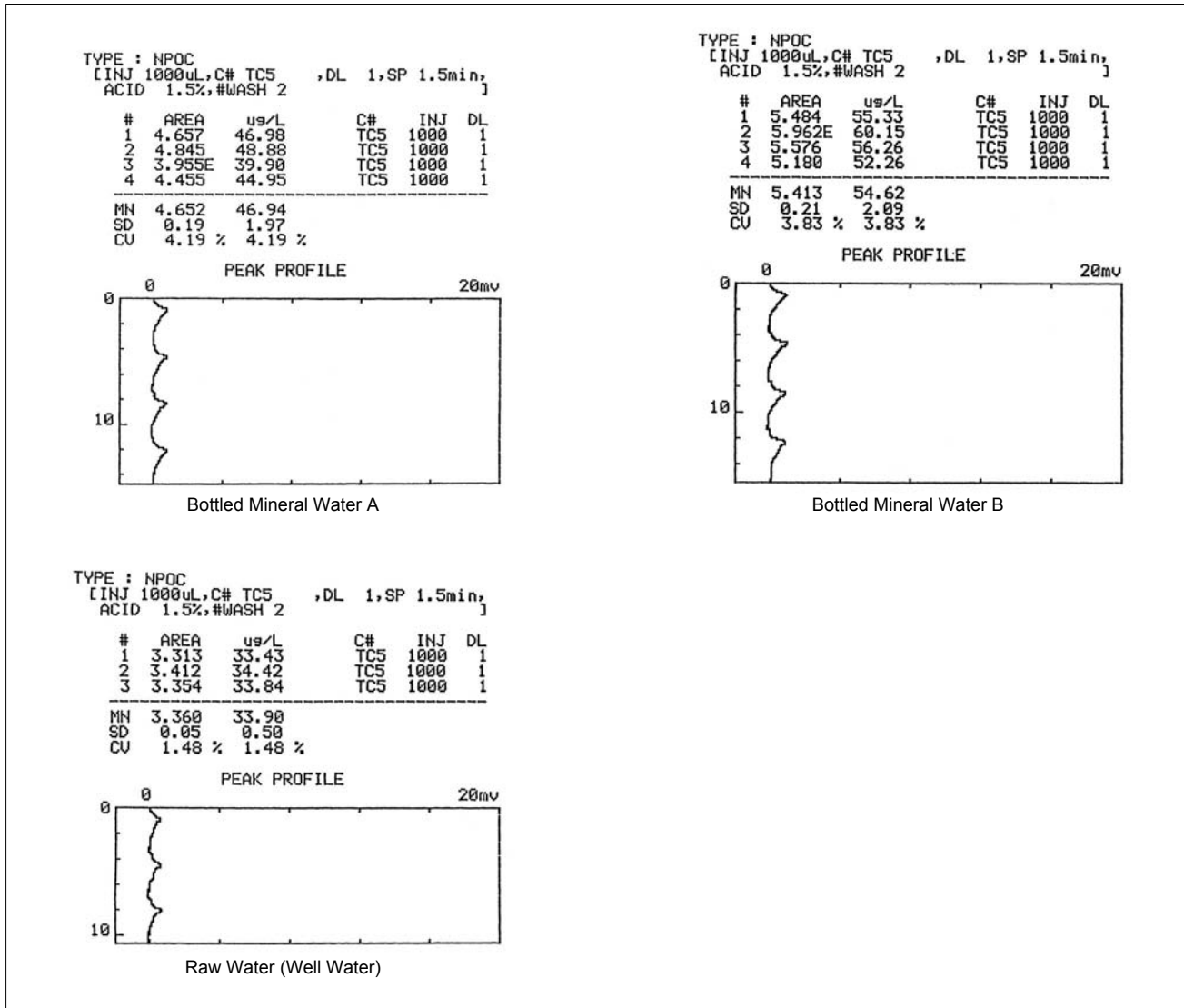
carbon) shall be no more than 3mgC/L (=3000µgC/L). Although the TOC values of the two samples were much lower than this criterion, they were analyzed with a high precision.

HUV`Y%A YUgi fYa Ybh8 UU

Sample Name	Analysis Result TOC Value (µgC/L)
Bottled Mineral Water A	46.9
Bottled Mineral Water B	54.6
Raw Water (Well Water)	33.9

HUV`Y&8 f]b_]b[`K UHf`Ei U]mi7 f]hvf]U

Water Quality Measurement Item	Criteria
Organic substances (content of total organic carbon (TOC))	No more than 3 mg/L



:] [`&A YUgi fYa YbhFYgi `lg Zf`Hk c`HndYg`cZ6 cfiYX`A]bYfU`K UHf`UbX`F`Uk`K UHf`



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