

Analysis of formaldehyde and acetaldehyde in environmental water with 1,3-Cyclohexanedione-post column derivatization

Aldehydes in the environment are present not only in the air but also in rain, river and lake water.

One method for measuring aldehydes employs pre-column derivatization using 2,4 DNP. However, because of the necessity for additional processing such as concentrating, the care required to ensure low background means that this method is not so easy to use.

Here, using 1,3-cyclohexanedione post-column derivatization and without pre-processing such as concentrating, filtered samples were injected directly and formaldehyde and acetaldehyde in environmental water were measured.

Fig. 1 and Fig. 2 show the derivatization reaction and system schematics respectively; Fig. 3 ~ Fig. 7 show the chromatograms of standard and environmental water samples.

Keywords: 1.aldehyde, 2.STD mixture, Environmental water, 3.KC-811, 4.FL, 5.1,3-Cyclohexanedione postcolumn derivatization

Conditions:

Column : Shodex Ionpak KC-801P+KC-811
 Eluent : 3mM HClO₄
 Eluent Flow rate: 1.0 mL/min
 Column Temperature: 60 degree celsius
 Reagent: 2.5g Cyclohexanedione +
 20g Ammonium acetate +
 10mL Acetic acid in 500mL H₂O
 Reagent Flow rate: 0.6mL/min
 Reaction Temperature: 120 degree celsius
 Wave length: Ex 366nm, Em 440nm, Gainx10
 Sample: STD mixture
 Environmental water
 INJ. VOL. : 100uL

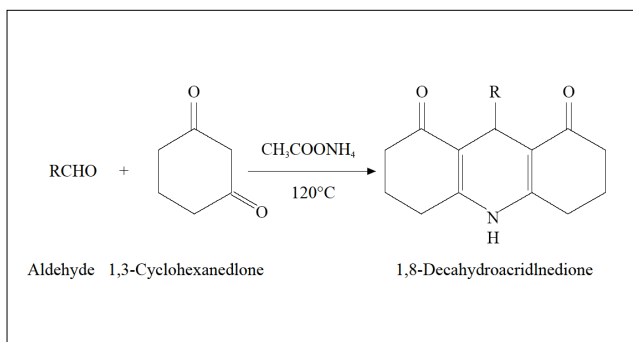


Fig. 1 Derivatization reaction

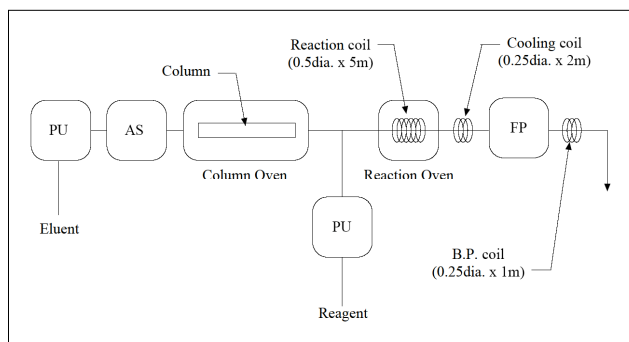


Fig. 2 System schematics

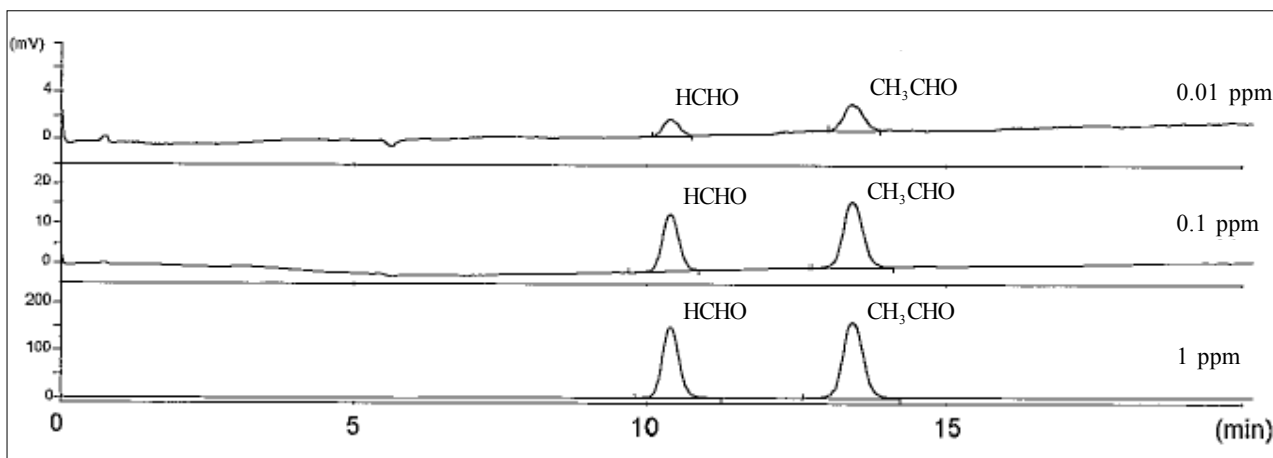


Fig. 3 Standard sample chromatogram

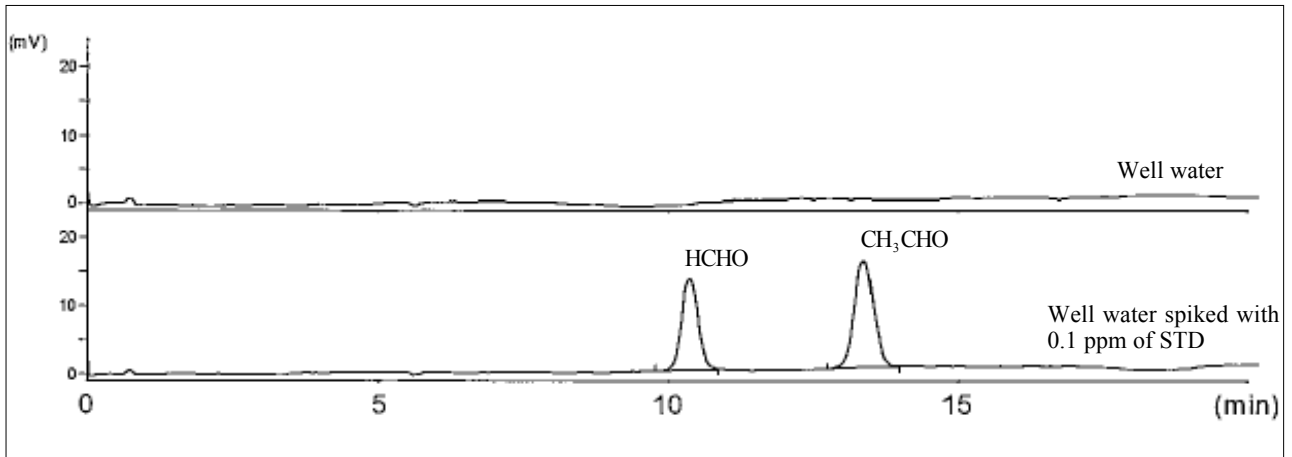


Fig. 4 Chromatograms of well water and well water spiked with 0.1 ppm of standard sample

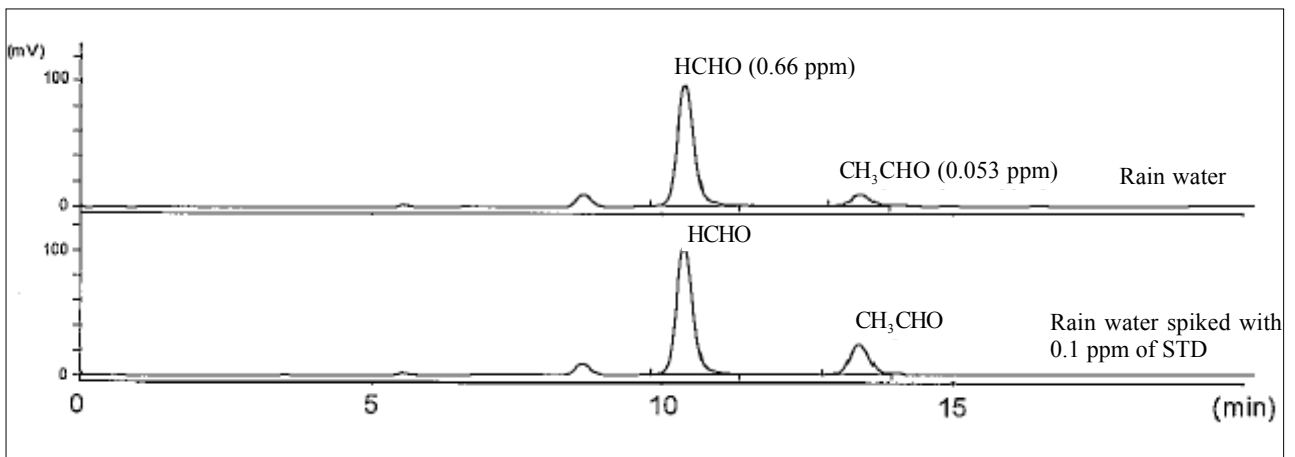


Fig. 5 Chromatograms of rain water and rain water spiked with 0.1 ppm of standard sample

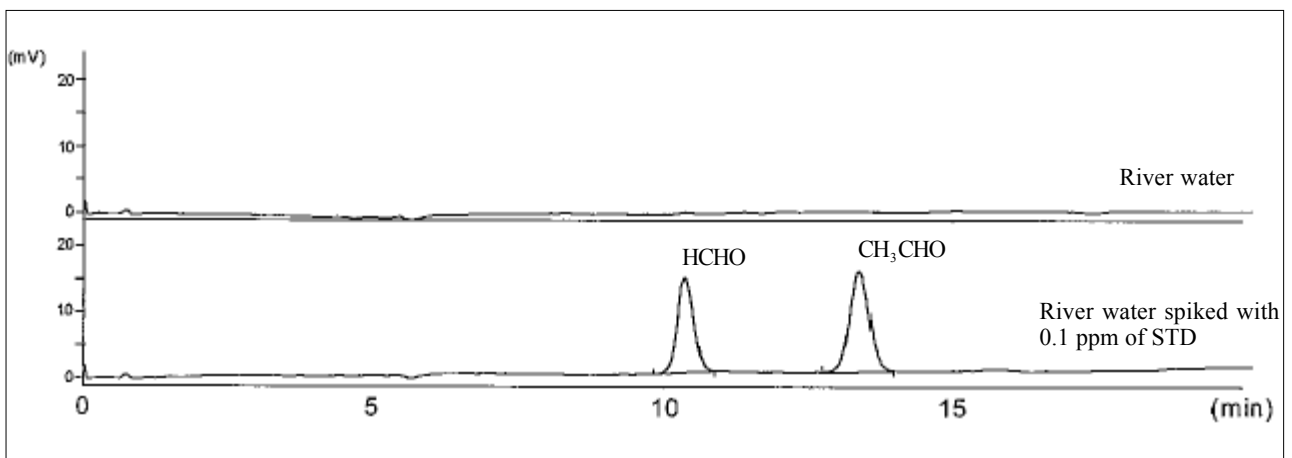


Fig. 6 Chromatograms of river water and river water spiked with 0.1 ppm of standard sample

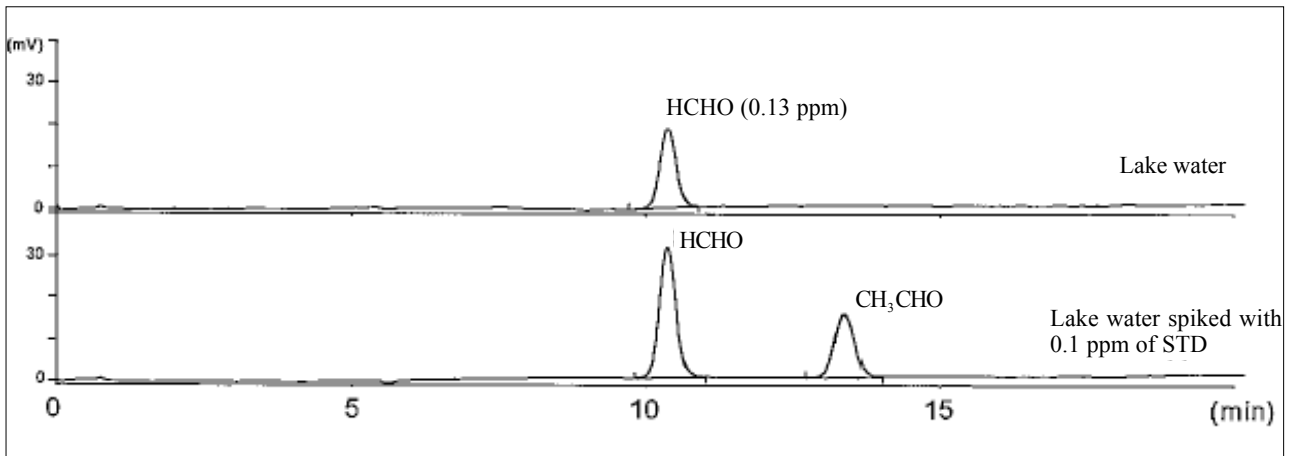


Fig. 7 Chromatograms of lake water and lake water spiked with 0.1 ppm of standard sample