

Dew Point Measurement of Gases with Optical Waveguide Technique

Slab optical waveguide (SOWG) spectroscopy is the optical absorption spectroscopic techniques using a thin planer waveguide as an internal total reflection medium. Remarkable features of this technique are the selectivity to the surface and the high sensitivity. As a new field of the application, an experimental dew point measurement system based on the SOWG technique was tested for moisture analysis in high purity gases. It was consisted of a thin glass plate with the thickness of 0.1 to 0.5 mm, optical detecting components and a Peltier cooler. Our results show that this system has the good sensitivity and quick response.

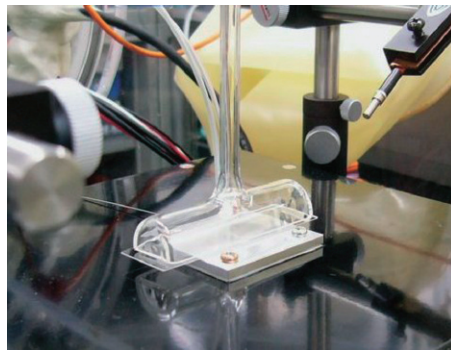


Fig 1: Detection part of the system.
Sample gas was blown down onto the SOWG on the Peltier cooler.

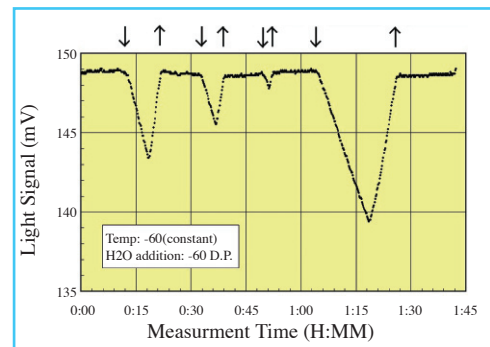


Fig 2: Response of the optical intensity against the moist sample gas.
Switching to the sample from dry gas is indicated by down-arrows.

Kenji Kato

Metrology Institute of Japan

E-mail:

k.kato@aist.go.jp

AIST Today Vol.5, No.4 (2005)
p.30-31

Life Science & Technology

Structural basis of HutP-mediated regulation mechanism of antitermination of transcription

HutP regulates the expression of the hut structural genes of *Bacillus subtilis* by an anti-termination mechanism. A study of the crystal structure of HutP protein bound to a conserved sequence of the terminator of the hut mRNA show how HutP specifically recognizes the RNA and reveals the unexpected direct role of the Mg^{2+} ion for mediating the L-histidine-dependent structural rearrangement in the protein. Additional structural analyses revealed intermediate structures and allowed us to conclude that the Mg^{2+} ion together with L-histidine plays a major role to activate the HutP protein for binding to its cognate RNA.

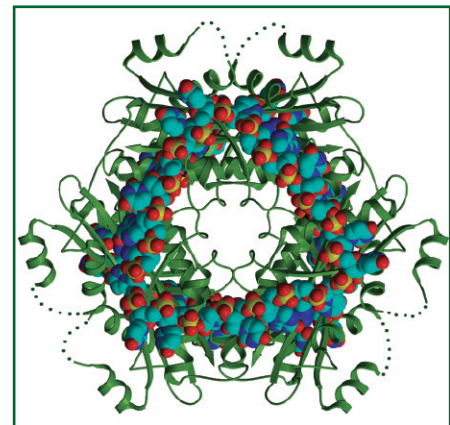


Figure: A novel anti-termination complex forms a wreath adorned with RNA.

Penmetcha Kumar

Institute for Biological
Resources and Functions

E-mail:

pkumar@aist.go.jp

AIST Today Vol.5, No.5 (2005)
p.20-21