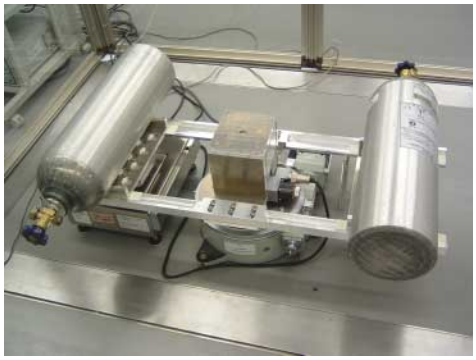
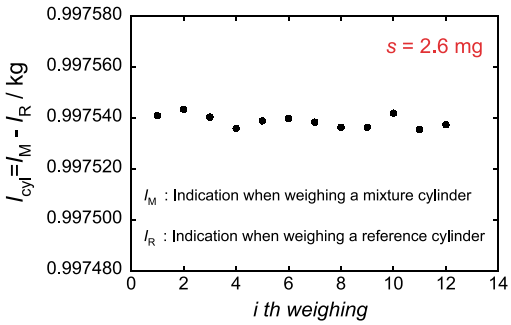
High-Accuracy Mass Measurement for Preparation of Reference Gas Mixtures

Nobuhiro
MASTUMOTO
Metrology Institute of Japan
e-mail :
nobu-matsumoto@aist.go.jp
AIST Today Vol. 3, No. 3
(2003) 19

Reference gas mixtures are used for calibration of gas analyzers for environmental measurements. Gravimetric preparation method is one of the methods to be able to realize high-accuracy gas mixtures. In this method, concentration of mixture can be calculated from mass of each component gas. However, the buoyancy effect on large gas cylinder interferes high-accuracy mass measurement. Then, it is required to minimizing the effect by an appropriate balance. We have successfully developed unique equipment that has automatic alternative loading mechanism of gas cylinders (Mixture and referece cylinders) for mass measurement with accuracy of several milli grams (Photograph and Figure). The reference gas mixtures prepared using this equipment have been validated in the international comparisons, for example, CCQM-P41"Greenhouse gases".



NMIJ Balance for gravimetric preparation of reference gas mixtures



Result of weighing the difference between mixture and reference cylinder using NMIJ balance