

# QCM

QUARTZ CRYSTAL

# AFFINIX® Series

MICROBALANCE

INITIUM  
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## AFFINIX series cover a wide range of research areas to realize your ideas.

The "AFFINIX" series is based on Quartz Crystal Microbalance (QCM) technology that enables Label-free and Real-time mass sensing on a surface with high sensitivity and low cost.

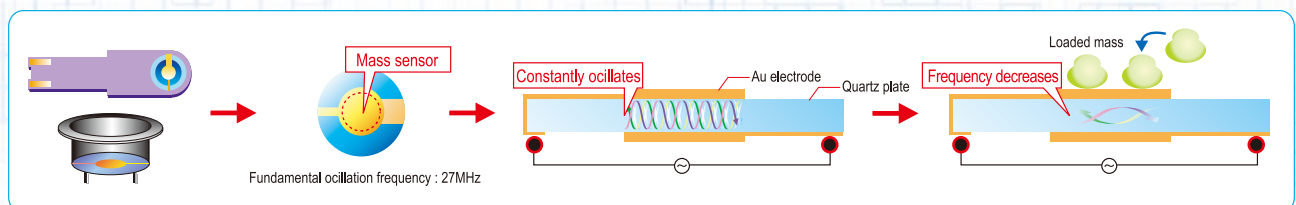
Applications of our sensing systems cover various research fields, biomolecule interaction, cell-based assays and material evaluation.



## Measurement Principle

A QCM sensor consists of very thin quartz disc with gold electrodes on both sides.

By connecting oscillation circuits, the QCM sensor oscillates at its own resonance frequency (27 MHz) due to the piezoelectric properties of quartz. This oscillation is highly stable, and the resonance frequency decreases linearly by mass load on a QCM sensor surface.



## Major Applications



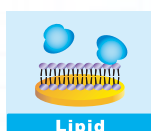
- Protein - Protein interaction
- Antigen - Antibody reaction
- Aggregation of  $\beta$ -Amyloid



- Hybridization
- Detection of mismatched base pair
- RNA - DNA, RNA - Protein



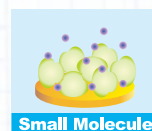
- Sugar - Protein interaction
- Hydrolysis of Polysaccharides
- Polymerization by Glycosyl transferase



- Lipid - Antibacterial Peptide interaction
- Liposome binding
- Supported Lipid bilayer



- Hydrolysis reaction by DNase
- Degradation by Trypsin
- Elongation reaction by Polymerase



- Evaluation of Inhibitor
- Evaluation of Medicine binding
- Ligand - Receptor interaction
- Evaluation of Toxin



- Polymer Materials - Biomolecule interaction
- Polymer decomposition
- Evaluation of Biocompatible Polymer
- Particle's adsorption

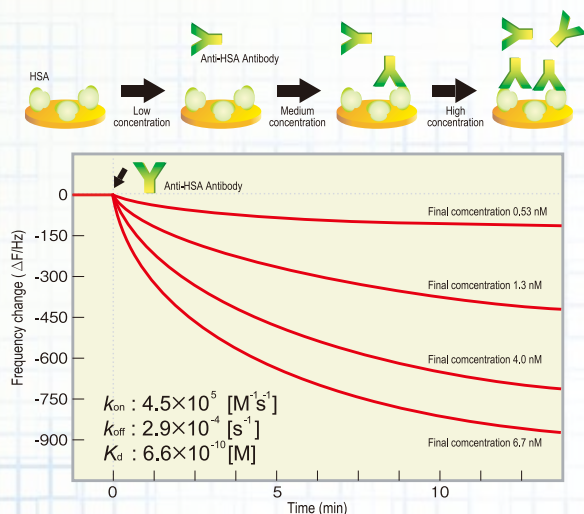


- Adhesion to Carbon nanotube
- Metal dissociation
- Evaluation in Crude solution
- Evaluation of effective Detergent

## Biological Application Example

### Kinetic analysis of Antigen-Antibody reaction

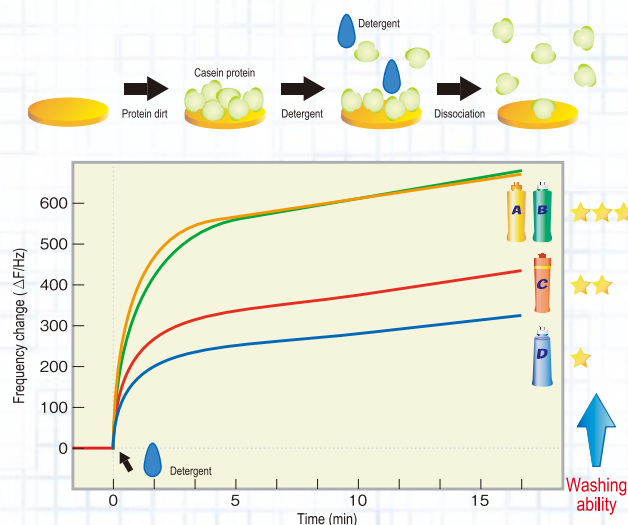
- Equilibrium and kinetic analysis of interactions of biomolecules such as proteins, DNA and carbohydrates.
- Detection of antigen from crude sample.
- Evaluation of developed antibody.
- Protein adsorption on surface.



## Other Application Example

### Washing ability evaluation of kitchen detergent

- Washing evaluation of the effectiveness of various detergents on protein removed.
- Enzyme degradation of adsorbed proteins.



## Features

- Real-Time, Label-Free Monitoring
- Extreme Sensitivity (30 pg mass changes per 1 Hz frequency change)
- Binding Constants of Biomolecular Interactions
- Kinetic Parameters
- Application Versatility
- Simple & Easy Operation
- Easy Maintenance
- Low Running Cost
- Analytical Software Packaged
- Compact Size

## Specifications

Item	Model	AFFINIX QN	AFFINIX QN $\mu$	AFFINIX Q4
Measurement Principle		Quartz Crystal Microbalance (QCM)		
Oscillation Frequency		27 MHz (Fundamental frequency)		
Sensitivity		30 pg/Hz		
Dynamic Range		100 pg ~ 10 $\mu$ g		
Oscillation Stability		Noise < 1 Hz (Distilled water at 25°C)		
Injection Volume		0.1 $\mu$ l ~ and up		
Measuring Channel Number		1 (Channels can be added up to 4)	1 (Channels can be added up to 4)	4
Cell Volume		Mini cell [1.6 ml] . Glass cell [5~11 ml]	Plastic cell [400~550 $\mu$ l]	Plastic cell [450~550 $\mu$ l]
Sensor Type		Sensor chip	Sensor cell	Sensor cell
Stir Method		Magnetic stirrer	Magnetic stirrer	Vertical motion
Setting Temperature		0.1~50.0 °C	10.0~50.0 °C	10.0~40.0 °C
Data Processing Part		Windows Laptop PC		
Unit Dimension*(W x D x H)		140 x 300 x 220 (mm) 5.5 x 11.8 x 8.7 (in)	140 x 300 x 220 (mm) 5.5 x 11.8 x 8.7 (in)	360 x 440 x 220 (mm) 14.2 x 17.3 x 8.7 (in)
Weight		7.7 kg (17.0 lb.)	7.1 kg (15.7 lb.)	20 kg (44.1 lb.)
Power Supply		AC 100~240 V, 1 A	AC 100~240 V, 1 A	AC 100 V, 5 A
STD accessory (Quantity)		AFFINIX QN Base equipment Measuring software installed Laptop PC PC accessory (LAN cable included) Glass cell (1), Magnetic stirrer (1) Sensor chips (4), USB flash memory (1) Viewer software (1)	AFFINIX QN Base equipment Measuring software installed Laptop PC PC accessory (LAN cable included) Magnetic stirrer (1) Sensor cells (4), USB flash memory (1) Viewer software (1)	AFFINIX Q4 Base equipment Measuring software installed Laptop PC PC accessory (RS-232C cable included) Sensor cells (4) Vaporization protection cover (1) Viewer software (1)
Optional accessory		Sensor chips (4), Glass cells Magnetic stirrer, Mini cells	Sensor cells (4) Magnetic stirrer	Sensor cells (4)
Analytical Software : AFFINIX Q User Analysis (AQUA)				

\* W=Width, D=Depth, H=Height

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