

Summary

An immunosensor application for determination of carbaryl pesticide was developed using the AWS A20 Research Platform and the AWS F20 Fluidics Platform. Two kinds of acoustic sensors were employed: AWS HFF-QCM sensors and Love Wave-SAW sensors with their appropriate flow cells.

Introduction

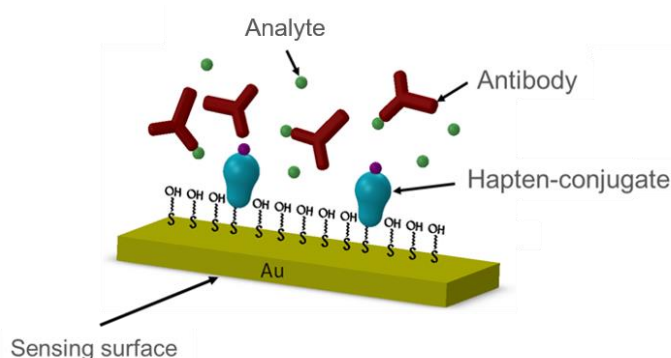
In this Application Note, carbaryl was chosen as the model analyte. The AWS A20 Research Platform allowed monitoring phase-shift changes at constant frequency as a function of the sensor's surface mass changes. The AWS F20 Fluidics Platform allowed to control the flow and sample injection over the sensors' surface.

Materials and Methods

Sensor functionalization. Carbaryl hapten-conjugate was covalently immobilized by means of Self-Assembled Monolayer (SAM).

Immunoassay format. The chosen competitive immunoassay was a binding-inhibition test based on conjugate-coated format. Carbaryl analyte competes against the immobilized hapten-conjugate for monoclonal antibodies.

Carbaryl detection. Samples were injected onto the sensors' surfaces. AWS software allowed controlling sample injection and fluidics. Furthermore, the employed platform allowed performing the measurements at a constant temperature of $25\text{ }^{\circ}\text{C} \pm 0.05\text{ }^{\circ}\text{C}$.



Results

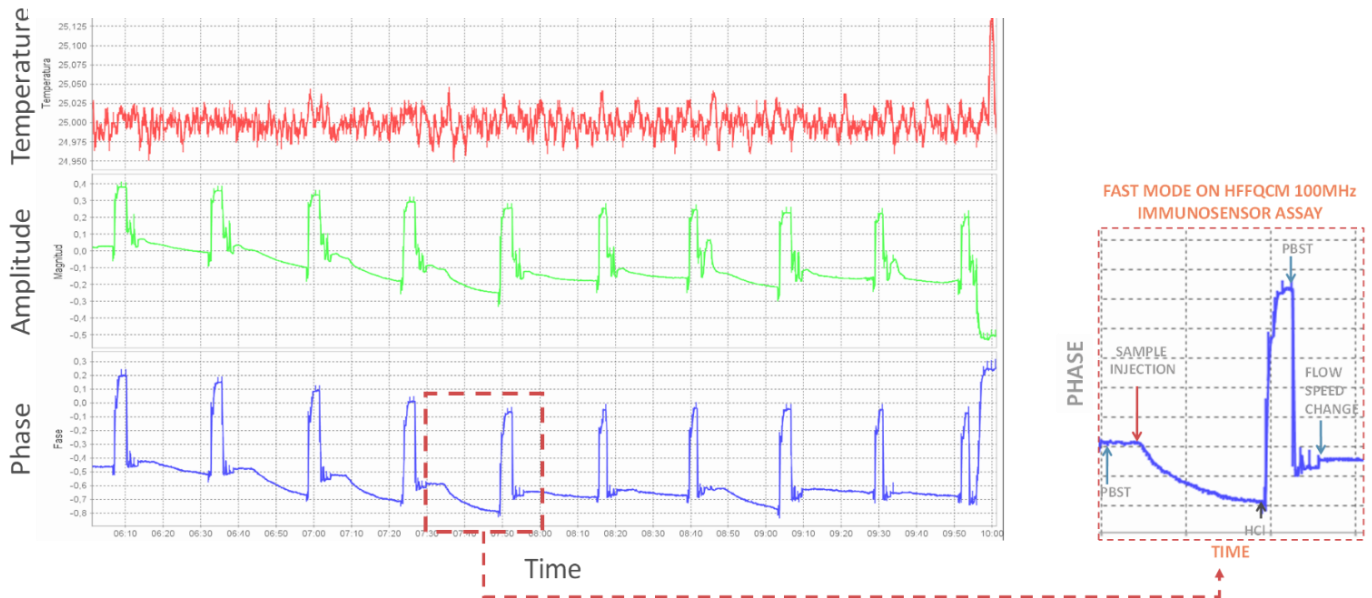
Since analyte inhibits antibody binding to its respective immobilized conjugates, increasing concentrations of analyte are detected by a change in the increment of the phase-shift of the sensor. The following figures present a representative assay cycle selected from a continuous monitoring in a carbaryl determination, for 100 MHz HFF-QCM and 120 MHz Love Wave-SAW sensors.



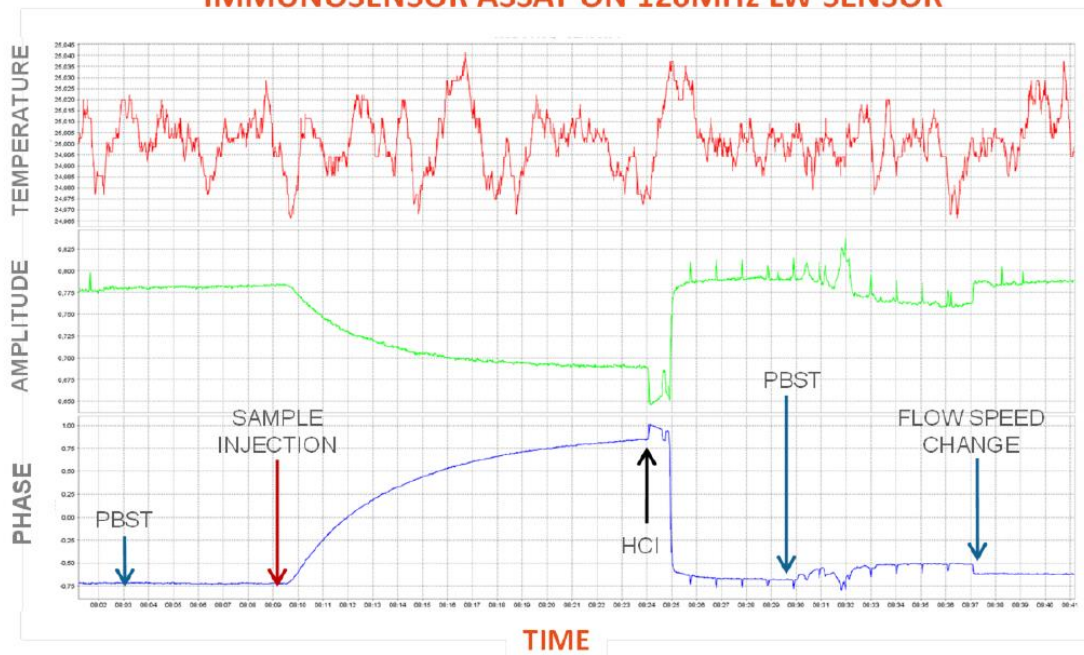
Application Note

Detection of low molecular weight pollutants

IMMUNOASSAY CYCLE FOR CARBARYL DETECTION WITH AWS HFF-QCM 100 MHZ SENSOR



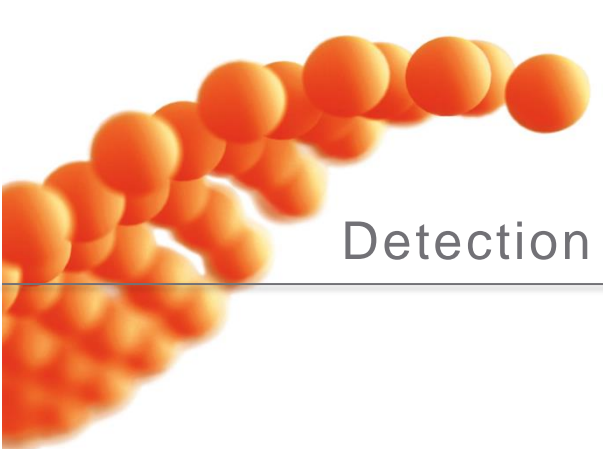
IMMUNOSENSOR ASSAY ON 120MHz LW SENSOR



AppNote EQCM AWS A20+ AWS HFF-QCM



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Application Note

Detection of low molecular weight pollutants

Order Information

Product	Quantity	Reference
AWS A20+ RP – 2 channels	1	AWS A20+ 000012 A
AWS F20+ FP – 2 channels	1	AWS F20+ 000022 A
HFF-EQCM flow cell for AWS A20+	1	AWS CLS+ 000115 Q
AWS HFF-QCM sensor, 100 MHz	1	AWS SNS 000001 A
Love-SAW flow cell for AWS A20+	1	AWS CLS+ 000013 A
AWS Love-SAW sensor, 120 MHz	1	AWS SNS 000069 A

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