S2.4.4 Evolution of Amperometric Gas Sensors for Air Quality and Personal Exposure Monitoring

Mel Findlay, Joseph Stetter, Michael Carter
KWJ Engineering,

Chemical gas sensors face an uphill challenge in integration into the "Internet of Things" and Smart/Connected Homes. Until recently, technology has not been able to meet cost-size-performance targets for high volume distributed chemical sensing applications. KWJ's innovative approach combines printed electronics manufacturing capability with nanotechnology for gas sensing to enable a disruptive sensor platform for many important gases [CO, alcohol, O2, O3, NOx, SOx, H2S, Cl2, H2, CO2, and others].

The near term needs are clear for chemical sensors: increased respiratory illness especially among the very young and elderly, elevated air pollutant levels in many cities of Asia and emerging countries. The drivers for enabling implementation are just as clear: Billions of cellphones and tablet devices are available as platforms for personal environmental measurements and controls. There are more than130 million homes, each with multiple appliances, in the USA alone. These factors of increased need and available platform combine to highlight the opportunity for large volumes of gas sensors for environmental awareness and health/safety protection.

In this context, we present the characteristics and technology for new printed sensors and novel MEMS thermal sensors. We will present field data collected for a variety of applications, illustrating improved performance, demonstrating that these sensors are ideal for health, environmental, industrial and residential monitoring, because of their high performance, low cost and small size.