HYDROGEN SENSORS FOR THE NEW MILLENIUM:

1. Most Amperometric hydrogen sensors suffer severe interference from Carbon Monoxide even at low levels of hydrogen or CO [Figure 1].

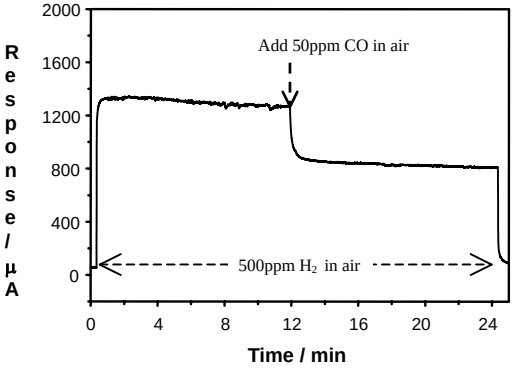
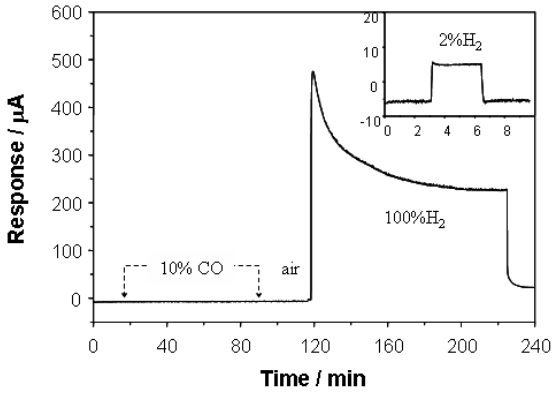
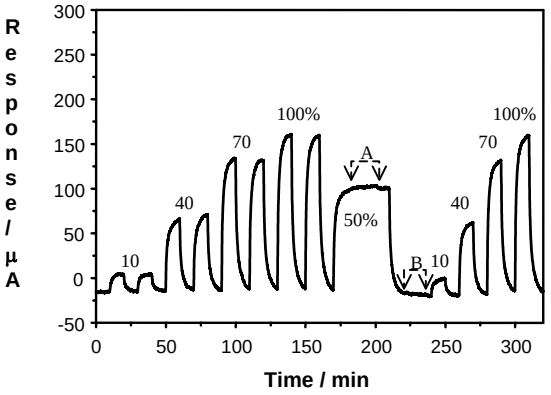


Figure 1. Response of typical 3-electrode amperometric sensor to hydrogen. Sensor has Pt diffusion electrode, acid electrolyte, and potentiostatic control illustrating the instability of the hydrogen response and severe interference from CO even at low levels.

2.] We have been able to develop an Amperometric Gas Sensor [AGS] that is selective only to hydrogen! Signals for CO and other typical interference are eliminated [Figure 2].

Figure 2. Response of CO on AGS H_2 Sensor illustrates no CO interference and a stable hydrogen signal at H_2 levels up to 2% but instability at high H_2 concentrations. Other interferences that give no signal include high levels of common gases/vapors like: NH_3, H_2S, SO_2, NO_x, VOCs [data not shown].





The instability to H_2 can be eliminated in the final H_2 AGS design [Figure 3] producing a sensor that is both selective and stable: Since it is an AGS, it is also has the important characteristics of low cost, ultra low power and long lifetime.

Figure 3. Signals repeated for 10 to 100% hydrogen with exposure to 1-3% CO at 50% hydrogen [A] and 5% CO at 0% hydrogen [B] for the NEW TTI HYDROGEN SENSOR.

This hydrogen sensor can be made available in the new nanotechnology enabled TTI Pocket Package creating a new Pocket H_2 Instrument for direct readout. More than one year lifetime, temperature compensated, no consumable supplies, no chargers or electronic connections, just the simplest, most convenient, and lowest cost direct measurement possible!

TTI Pocket Platform