Pinpoint even the smallest hydrogen leaks with a gas permeable matrix (tape, polymer, or ceramic) loaded with color changing pigments that are extremely sensitive to hydrogen gas.

Executive Summary
UCF scientists have created a new gas permeable matrix that protectively encapsulates active chemochromic compounds able to detect small amounts of a specific target gas. This matrix enhances the sensitivity of hydrogen detecting pigments and functions at a range of temperatures as low as -40°C. Interference and false positives due to the presence of other reducing gases such as carbon monoxide and water vapor are significantly reduced. Pigment formulations have been created to allow the color change to be reversible once the gas leak is repaired. The color change process, and thereby regenerating the sensor, is both quick and easy. The final enhancement of sensitivity comes from selected additives which give deeper color changes and faster reaction times.

Background
Hydrogen gas is used in fuel cells, electric vehicles, and NASA rockets. It is odorless, colorless and highly flammable, with a lower flammability limit of 4% in the air. Therefore, when storing and transporting hydrogen, it is important that leaks are immediately detected. One common method for detecting hydrogen gas leaks is the use of palladium metal based sensors. Unfortunately, sensors based on palladium alloys require a high operating temperature (200°C) and even higher temperatures (500°C) to reactivate the sensing material. Palladium alloys are also sensitive to other gases commonly found in the atmosphere such as water vapor, carbon monoxide and hydrogen sulfide.

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For more information on hydrogen sensitive color changing pigments see UCF ID# 31212

Benefits
• Matrix variations can be flammable resistant
• Practical and low-cost gas sensor
• Faster discoloration reaction
• Can operate over a wider ambient temperature range
• Less affected by weather and environmental contaminants and / or presence of other reactive gases

Tech Fields
Hydrogen Fuels

Keywords
hydrogen gas, hydrogen detection, hydrogen leak, chemochromic pigments, tape, paint, ceramics

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If you or your company are interested in this opportunity, Contact:
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