July 1971

Brief 71-10209

NASA TECH BRIEF

Marshall Space Flight Center

Sensitive Gaseous Hydrogen Detection System

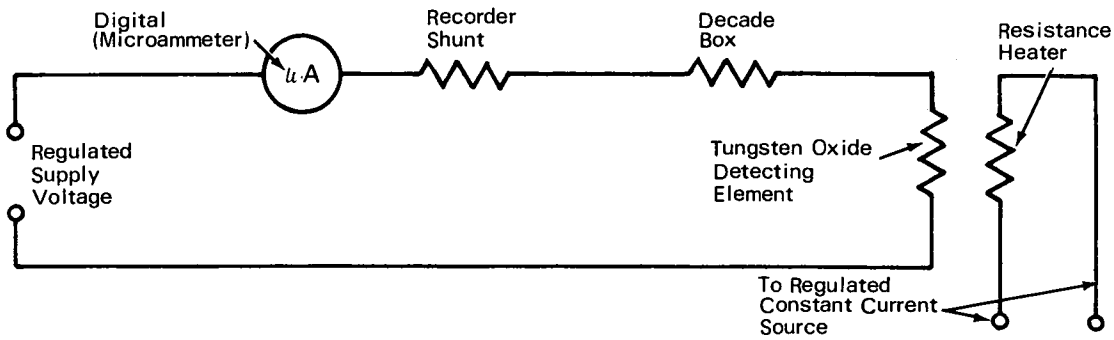
An extremely sensitive hydrogen detection system can measure the concentration of gaseous hydrogen in air to a sensitivity as high as several parts per million. The system uses a new type of hydrogen sensor as the detecting element, and has an overall detection sensitivity and response speed that are higher than conventional hot-wire or hot-thermistor types of detectors.

The detecting element is a thin-film tungsten oxide (WO_3) resistor sensitized to hydrogen by the addition of very small amounts of platinum. When the sensitized detecting element is maintained at a temperature in the range of 523 K to 673 K (250° to 400° C), its electrical resistance (which is inversely proportional to the microammeter reading) varies by a factor as large as 10^6 to 1 in response to corresponding variations in the ambient hydrogen concentration. Because the detector is a rugged thin-film resistor requiring only simple electronic circuitry, the system can be conveniently and economically employed throughout a given installation.

The system can be adapted to serve as a leak detector and hydrogen-concentration hazard alarm wherever hydrogen is used; i.e., in industrial processes, hydrogen bubble chambers, mines, refineries, chemical process plants, and aerospace facilities.

Notes:

1. Hydrogen concentrations of from 2 parts per million to 30% have been measured with this system.



2. The following documentation may be obtained from:

   National Technical Information Service
   Springfield, Virginia 22151
   Single document price $3.00
   (or microfiche $0.95)

   Reference:
   NASA-CR-10268 (N70-25297), Gaseous Hydrogen Detection System

Patent status:

No patent action is contemplated by NASA.

Source: J. R. Macintyre and W. C. Neppel of
General Electric Co.
under contract to
Marshall Space Flight Center
(MFS-21161)

Category 04,01