

## SOURCE TEST METHOD 17

## COMBUSTIBLE GAS DETECTION USING CATALYTIC OXIDATION

1. Principle

By complete combustion, the concentration of a flammable gas or vapor can be determined.

2. Description

The affect of the heat of combustion on filaments with temperature sensitive resistances gives a determination of the amount of combustion (based on heat of combustion of hexane), and hence, the amount of any flammable gas or vapor present.

3. Equipment

The probe is made of stainless steel tubing and is connected to the filaments by plastic tubing. A pump is used to draw a sample continuously through the filaments. The two filaments (thermistors), one for combustion and one for reference, are made of platinum catalysts and are connected as opposing arms to a balanced Wheatstone Bridge circuit. One of the filaments is exposed to, or reacted with, the gas sample, and its change in resistance unbalances the bridge and is measured by an indicating meter whose scale provides the reading in terms of parts per million. A filter and dryer made of "Drie rite" and plastic foam can be used to remove the cooling effects of moisture and the damaging effects of particulates.

4. Procedure

Before sampling, the battery voltages are checked and the instrument allowed to warm up for two to three minutes. The instrument is placed on a stable, level surface before any adjustments or sampling is made. The probe, hose, and filaments are purged with combustible gas-free air, and the meter adjusted to zero. The probe is placed in a representative position, a sample is drawn across the thermistors and the maximum reading observed and recorded. A second sample is taken and compared with the first to insure a representative sample has been taken. If the sample gas is more than 40% water vapor, or over 200°F, the gas is collected in a bag and allowed to cool to approximately 100°F or less before proceeding to instrumental sampling.

5. Analysis

If a single, combustible gas is being sampled, calibration curves can be used to determine its concentration. If a mixture of combustible vapors or gases is analyzed, a nonspecific determination of their total concentration is made.

6. References

"Instruction on Maintenance Manual for Model SS-P Combustible Gas Indicator." Johnson-Williams Products, Bacharach Instrument Co., Mountain View, Calif.