UNIVERSITY OF HOUSTON – DOWNTOWN

ENGR 4310 - INDUSTRIAL HYGIENE INSTRUMENTATION

LECTURE NOTE OUTLINE – AIR SAMPLING – CHAPTER 16

WEEK 11

I. Types of Air Sampling
   - A. Personal vs. Area
   - B. Grab vs. Integrated

II. Air-Sampling Categories
   - A. Sample Collection Devices – Sample Train
   - B. Direct-Reading Instruments

III. Gas and Vapor Collection Devices
   - A. Grab Sampling
   - B. Integrated Air Sampling
     1. Absorption
     2. Adsorption
   - C. Passive Monitors

IV. Particulate Collection Devices
   - A. Filters
   - B. Cyclones
   - C. Electrostatic Precipitators
   - D. Inertial Impactors
   - E. Impingers

V. Other Sampling Equipment
   - A. Pumps
   - B. Flow-rate meters
     1. Pressure-compensating devices
     2. Critical-flow orifice

VI. Sampling Methods
    A. Selection
    B. Method Elements

VII. Calibration
    A. Primary Calibrators
    B. Secondary Calibrators
    C. Parameters
        1. Temperature/Pressure
        2. Error
        3. Sampling Technique
    D. Error

VIII. Record Keeping

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LECTURE NOTE OUTLINE – DIRECT READING INSTRUMENTS FOR GASES, VAPORS, AND PARTICULATES – CHAPTER 17

WEEK 11

I. Single/Group Monitors
- A. Combustible Gas
- B. Oxygen Monitors
- C. Carbon Monoxide Monitors
- D. Indoor Air Quality Monitors
- E. Others
  1. Mercury Vapor
  2. Formaldehyde Vapor
  3. Direct-Reading Colorimetric Tubes/Badges
     - a. Active/Passive/Flow Rate
     - b. Result Interpretation
     - c. Specificity
     - d. Shelf Life
     - e. Certification
  4. Other Colorimetric Detectors

II. Broad Range Monitors
- A. Biosensors
- B. Nonspecific Detectors
  1. FID
  2. PID
  3. ECD
  4. TCD
- C. Spectrophotometers/Spectrometers
  1. Infrared
  2. FTIR
  3. Photoacoustic Spectrometers
  4. Surface Acoustic Wave Detectors
  5. Multisensor Arrays
- D. Gas Chromatographs
  1. GC
  2. GC/MS
  3. Ion Mobility Spectrometer
  4. Particulate Monitors/Fibers

III. Calibration
   A. Importance
   B. Procedure
   C. Performance Evaluation
   D. Instrument Specifications
   E. Electromagnetic Susceptibility