Development of a CO2 Analyzer for Health Monitoring

Roberto Ramirez: REU Student, Arizona State University
Graduate Mentor: Devon Bridgeman, Faculty Advisor: Dr. Erica Forzani

SenSIP Center, School of ECEE, Arizona State University

ABSTRACT

• Capnography device with volumetric and time-based measurements
• Measures CO2 in breath for detection of
  • COPD
  • Asthma
  • Cardiovascular Disease
• Uses LED/photodiode to measure light transmittance
• Consisted of Infrared light to determine absorbance of light

MOTIVATION

☐ Asthma is the most common chronic condition among children
☐ Currently affecting an estimated 6.2 million children under 18 years
☐ Asthma is a risk factor for developing Chronic obstructive pulmonary disease (COPD)
☐ COPD tends to develop in people past the age of 40
☐ An estimated 24 million Americans are diagnosed with it according to National Institute of Health

PROBLEM STATEMENT

Flow Calibration was inaccurate due to baseline drift
Flow = 0.0007235343*x.^3 - 0.0368134717*x.^2 + 3.2723474513*x - 0.6099685287;

METHOD

Colorimetric Carbon Dioxide Sensor
☐ A solution of m-cresol purple, glycine, and quaternary amine base coated in a thin film on a porous Teflon membrane
☐ Translates the color change of the sensor into a signal
☐ Factors of sensor:
  • Temperature,
  • Humidity,
  • Barometric pressure
  • Flow Rate

INITIAL RESULTS

Sensor Signal and Information Processing Center
http://sensip.asu.edu

REFERENCES


