DAYANANDA SAGAR COLLEGE OF ENGINEERING

Shavige Malleshwara Hills, Kumaraswamy Layout, Bengaluru - 560111, (An Autonomous Institution, Affiliated to VTU, Approved by AICTE & UGC, Accredited by NAAC with 'A' Grade, ISO 9001:2015 Certified)

DEPARTMENT OF MEDICAL ELECTRONICS ENGINEERING

Project Title: HUMAN BREATHALYZER TO MONITOR KETOSIS

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Guide and Designation: Prof Nanditha Krishna

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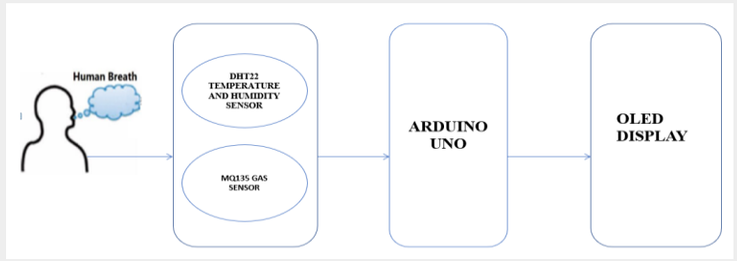
INTRODUCTION

- Acetone is a volatile organic compound that is produced as a byproduct of the metabolism of fats in the liver.
- Measuring acetone in breath can provide a non-invasive way to monitor the levels of ketones in the body.
- The range of acetone concentration in the breath of healthy humans is from 300 to 900 ppb and it is more than 1800 ppb for patients who have diabetes.

OBJECTIVES

- To study and analyze various parameters and existing methods that are used as a Breathalyzer.
- To develop a simple non-invasive device to monitor ketone levels as it is a key indicator for abnormal glucose level.
- To measure the concentration of acetone particles in the user's breath in order to give a ketone value as ketones in the body break down into volatile acetone.

METHODOLOGY



- The required instruments such as Arduino Uno board, gas sensor, temperature and humidity sensor are connected.
- Arduino code or program is uploaded to Arduino UNO from Arduino ide software.
- The code reads the analog signal from the gas sensor and convert it to a digital value. The digital values can be displayed on an LCD display or sent to a computer via serial communication.
- The calibrated sensor is used to measure the ketone concentration in a person's breath. This can be done by having the person exhale into the sensor for a few seconds.

RESULTS

The result of this method would be a measurement of a ketone concentration in the person's breath, taking into account of temperature and humidity.

SOFTWARE/HARDWARE COMPONENTS

HARDWARE USED:

Gas sensor
DHT22
Arduino Uno
OLED display

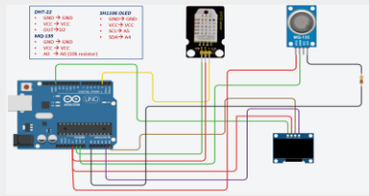


Fig : Hardware Simulation

SOFTWARE USED :

Arduino IDE

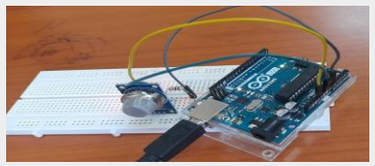


Fig :Assimilation of components

DISCUSSION AND CONCLUSION

Breathalyzers are a growing field of study because of their potential to have a significant positive impact on persons quality of life and compliance with acetone monitoring.
The designed acetone sensors must be effective enough to distinguish healthy breath from that of diabetics in clinical applications. In technological scale, the development of robust, cost effective, hand-held, noninvasive and portable breath monitoring sensor to detect the acetone found in the breath of diabetics becomes highly important in the healthcare field.