

Design and fabrication of breathable air level monitor regulating system

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ABSTRACT

In closed and engaged hall or rooms sometimes oxygen level is decreased. So, it's difficult to breathe normally. So, we had implemented an oxygen sensor to monitor the oxygen level. In this project we design and fabricate a system which automatically monitors the oxygen and carbon dioxide levels in rooms. If the oxygen level is decreased beyond the minimum set level, the microcontroller AT89C51 sends the signal to actuate the generator and oxygen generator will generate oxygen to the closed hall. We use a zeolite material that is used for air fresher and odours controller.

KEY WORDS: oxygen sensor, zeolite, AT89C51 microcontroller.

1. INTRODUCTION

Objective of this project is to maintain the oxygen level in closed hall or rooms sometimes engaged people which lead to breathe air with low level oxygen. It causes oxygen level in human blood is low or the carbon dioxide level is high which leads too many respiratory diseases like. The disease mainly affects men 20 to 50 years old people.

It may also occur in children. To avoid that a novel project is designed and developed this is described in detail. The system continuously and automatically monitors the oxygen and carbon dioxide levels. If the oxygen level decreased beyond the set level the oxygen sensor is sent the signal into microcontroller. Then AT89C51 microcontroller signal to actuate the oxygen generator.

2. EXPERIMENT ANALYSIS

Percentage of oxygen in atmosphere: In our living atmosphere Oxygen levels various from place to place. According to my practical experiments show the clear work research says the normal and safe oxygen levels is calculated between 19% to 23%. If the oxygen levels are exits over 100% it will causes heavy brain damages. While levels is between 19% to 14% it causes fast breathing, drowsiness, nausea and heart beat is fast. When it was get low to 12% it was unconscious stage, death will occur when it level less than 7%. A graphical representation had shown the clear display about the humans requirements of oxygen levels want to be presents in atmosphere or a closed halls.

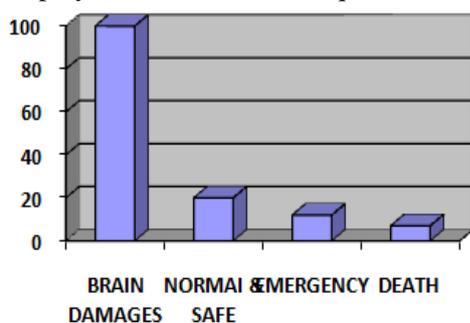


Fig.1. Brain Normal Emergency Death Analysis

Zeolite: Zeolite is nature minerals many years formation of volcanic ash and zeolite material is silicon, alum, etc. zeolite is unique negatively charged & honey comb frame of structure in zeolite. Zeolite materials way pass the mixture of gas such as methane, carbon di-oxide, hydrogen sulphate, water vapours and other gas.

Zeolite applications: It's used industries such as petroleum, chemical, water, air purifies and bio fuel production.

Methodology: This working of project in following steps, the first supply 240 v send the transformer. In this transformer 240V is step down to 15v supply. This supply is sent to regulator the regulator is converting in to +5v supply. The sensor is sensing the oxygen level which is sent ADC converter. Then the digital output is fed to AT89C51 microcontroller. The level is displayed using LCD and when the oxygen level is reached the minimum set value a pulse is sent to relay driver. Then the relay drivers' switch ON the relay and the signal are sent to start the motor. When the motor is started it will start the generator. Oxygen generated is filled into the room. When the oxygen level reached the maximum set value the relay driver is switched OFF by sending a control pulse by the microcontroller with the help of oxygen sensor indications. Then the oxygen generator is stopped. This process was continuously operated until it was shut down. We have placed the zeolite material in front of the oxygen generator .to supply the pure air.

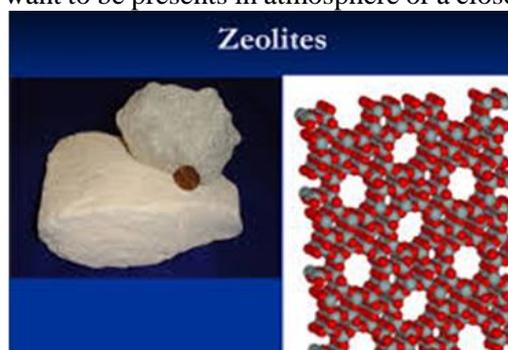


Fig.2. Zeolites Analysis

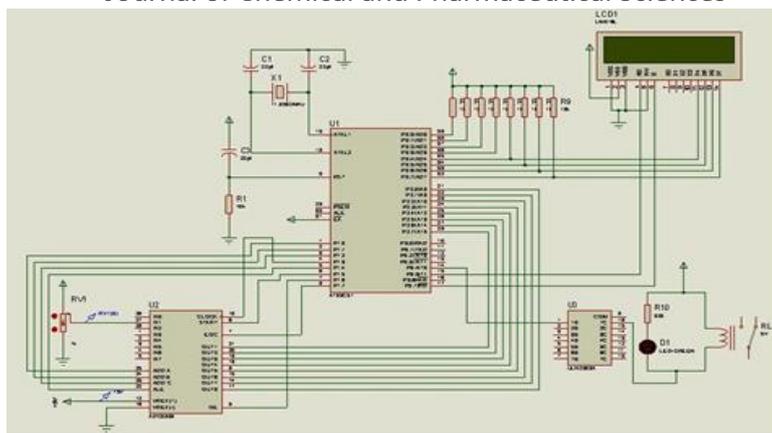
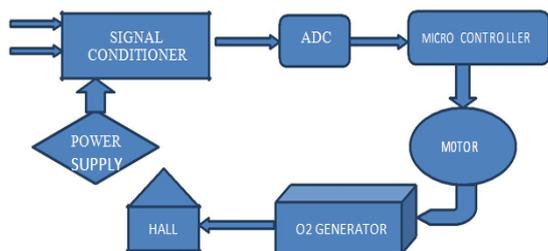


Figure 3.(a).Project Working Diagram

Figure 3. (b).Circuit Diagram

3. CONCLUSION

It has been shown that a “Design & Fabrication breathable air level monitor regulating system” with zeolites will produce pure oxygen. Using this new technology, a hospital and portable oxygen concentrator designs were developed. Currently no oxygen concentrator, portable or large, is able to produce 99% oxygen. The technology of pressure swing adsorption utilizing two types of silver zeolites presented here might possibly cause a revolution within the oxygen industry. Overall, it is now possible to deliver 99% oxygen to patients in a hospital, and those who want to enjoy a life without the restriction of limited oxygen supply in bottles of oxygen. Both models would be highly competitive in each respective market and would save consumers from the large expensive and heavy equipment of liquid oxygen supply. This is technology that will truly change the lives of millions of patients and those needing oxygen around the world for years to come.

REFERENCES

- Abman SH, Wolfe RR, Accurso RJ, Koops BL, Bowman CM, Wiggins JW. Pulmonary vascular response to oxygen in infants with severe bronchopulmonary dysplasia. *Pediatrics*, 75(1), 1985, 80-84.
- Collins MP, Lorenz JM, Jetton JR, Paneth N. Hypocapnia and other Ventilation-related risk factors for cerebral palsy in low birth weight Infants. *Pediatr Res*, 50(6), 2001, 712-719.
- Flynn JT, Bancalari E, Snyder ES, Goldbert RN, Feuer W, Cassady J, A cohort study of transcutaneous oxygen tension and the incidence and severity of retinopathy of prematurity. *N Engl J Med*, 326(16), 1992, 1050-1054.
- Halliday HL, Dumpit FM, Brady JP. Effects of inspired oxygen on echocardiographic assessment of pulmonary vascular resistance and myocardial contractility in broncho pulmonary dysplasia. *Pediatrics*, 65(3), 1980, 536-540.
- Noori S, Patel D, Friedlich P, Siassi B, Seri I, Ramanathan R. Effects of low oxygen saturation limits on the ductus arteriosus in extremely low birth weight infants. *J Perinatol*, 29(8), 2009, 553-557.
- Sink DW, Hope SA, Hag adorn JI, Nurse, and patient ratio and achievement of oxygen saturation goals in premature infants. *Arch Dis Child Fetal Neonatal Ed*, 96(2), 2011, F93-F98.
- Skinner JR, Hunter S, Poets CF, Milligan DW, Southall D, Hey EN. Haemodynamic effects of altering arterial oxygen saturation in preterm infants with respiratory failure. *Arch Dis Child Fetal Neonatal Ed*, 80(2), 1999, F81-F87.
- Supplemental therapeutic oxygen for pre threshold retinopathy of prematurity (STOP-ROP), a randomized, controlled trial. I: primary outcomes. *Pediatrics*, 105(2), 2000, 295-310.