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Introduction

Smoke filtering is the removal of contaminants from absorbed smoke to release to the environment. Such contaminants include, cigarette smoke gas, cooking odour, chemical fumes and carbon dioxide gas.

This is made possible by using activated carbon/charcoal which is a more perforated carbon such that its small pores capture smoke particles and debris. On further research we found out that activated carbon can remove up to 99.4% of airborne particles as well as adsorb volatile organic compounds like methane which is 28 to 34 times more potent as a greenhouse gas than carbon dioxide gas.

Objectives of the experiment are:

- Identification of components of smoke
 - Identification of substance to filter smoke
 - Identification of absorbing mechanism
 - Experimentation of research found
1. Identification of components of smoke
 2. Identification of substance to filter smoke

3. Identification of absorbing mechanism

Study showed that smoke can be absorbed into the device via suction effect where as the fans allowed the circulation of smoke within the device to be redirected into the filter through the different regions of pressure established by the rotating fans.

Method

Experiment 1

Aim: To determine presence of carbon dioxide gas in smoke

Requirements: Calcium hydroxide, beaker, a burning card box

Procedure:

A beaker with calcium hydroxide was set

A burning card box was introduced into the beaker and left for observation.

Observation: Milky solution was observed

Conclusion: Carbon dioxide present in the smoke.

Experiment 2

Aim: To determine substances that can be filtered by the activated carbon.

Requirements: Beaker, calcium hydroxide, box, two lids, a burning cardboard box, a bottle neck, mesh, activated carbon and a pipe



Results

Procedure

The two lids and mesh were joined together and activated carbon was put between them.

The filter was fitted with a bottle neck and fitted in a box.

The smoke was put through the filter and observations were made.

The filtered smoke was directed to the beaker with calcium hydroxide.

Observation

The smoke released was lighter than the absorbed smoke. According to the experiment, the smoke that entered the filter can be seen and observed by the naked eye but the filtered gas was colourless, hence to test the gas present namely carbon dioxide, a test was needed.

We tried to identify the presence of carbon dioxide through coloration of lime water where as the filtered smoke did not colorize the lime water.

Conclusion

The aim of this project is to determine an inexpensive and effective way of collecting and filtering smoke as it is a big challenge in our environment. This project aims at helping people with asthma, and other smoke triggered diseases as well as extracting the harmful part of the smoke.

This device can be modified according to one's use by changing the size of the fan, motor and box. The box can also be modified by using more durable materials like plastic.

Together with its many benefits the project has its challenges as well. The main challenge to our system is that the activated carbon in the filter must be replaced after about 160 hours of use.

Also the system so far does not remove allergens and bacteria hence more improvement is still needed to ensure it satisfies every demand.

We would like to suggest further research to be made on activated carbon as we believe it has more potential in the world of purification.

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