

# AIR PURIFYING MASK USING ACTIVATED CHARCOAL

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## ABSTRACT

Air purifying mask is to be made using certain substance which can trap harmful gases and micro dust. Thus, as per the need of an adsorbent, here we are using Activated charcoal. Activated charcoal contains large surface area and pores which can trap a lot of harmful gases. Due to a very high degree of porosity, even just one gram of activated charcoal has a surface area in excess of  $3,000 \text{ m}^2$  ( $32,000 \text{ sq ft}$ )<sup>[1]</sup>.

**Keywords:** Activated Charcoal Mask, Adsorption, Filters, Pore, Trapped

## I. INTRODUCTION

In everyday life we face problems regarding the air pollution and health hazards. When humans inhale the air, harmful pollutants enter the human body and which are dangerous to health<sup>[7]</sup>. Thus, here we are to make an Air Purifying mask. In this Air Purifying mask we here are using activated charcoal as a purifying agent. As we know that Activated Charcoal is an Adsorbent, hence it has the ability to trap lots of harmful gases. A gram of activated carbon can have a surface area in excess of  $500 \text{ m}^2$  ( $5,400 \text{ sq ft}$ ), with  $3,000 \text{ m}^2$  ( $32,000 \text{ sq ft}$ )<sup>[1][2][5]</sup>. Activated carbon or so called activated charcoal, is a form of carbon processed to have small, low-volume pores that increase the surface area available for adsorption or chemical reactions<sup>[3][6]</sup>. Even on further treatment like impregnation, its capacity of adsorption can be increased such kind of carbon is called as Impregnated Carbon<sup>[4]</sup>. Thus using such Activated charcoal we are going to make a Carbon filter, which can be inserted into a normal mask. Normal mask is nothing but a mask made up of cloth, which is washable or can say reusable. Now further about the filter which is to be made by using Sponge, Tissue paper/ Parchment paper and obviously Activated Charcoal. Here, we are impressing Activated Charcoal in the sponge. Thus, in this way, we will be able to make a simple carbon filter which can be used as purifier in mask.

## II. PROCEDURE

Step 1:

Using Activated Charcoal, at first place we will impress/spread activated charcoal inside a piece of sponge having a rectangular shape.

Step 2:

Now further, after impressing the activated charcoal, we will cover that sponge with a parchment or tissue paper on both the sides with large surface area, in order to protect the activated charcoal present inside the sponge, of letting it come out and also a kind of protection to the mask user so that the activated charcoal doesn't enter or get into that individuals body through nose.

Step 3:

Later on, we'll Air condition that filter by making some small holes on the Tissue or Parchment paper which is to be put up as a cover over the sponge. In order to let the air pass through the carbon filter and get it purified and also to take care that mask is not suffocating for the user.

Step 4:

Now we again, place a sponge having less thickness compared to sponge which is impressed by Activated charcoal, just as an another layer of protection to the Carbon filter. At last, we get 5 layered filter where the middle layer is made up of sponge with activated charcoal impressed in it and on side parts we put up layer of parchment/ tissue paper and over it a layer of sponge.

In this way get activated carbon filter, which can be used to put up in normal mask. Here, we'll make a pocket or compartment to the mask where we can insert this Carbon filter.

After long use of Mask, we can replace that Carbon filter with a new one and also the normal mask can be washed after a period of time i.e. The Mask is reusable

### **III. CONCLUSION**

1. This Mask is Cost Effective
2. Mask is quite Durable
3. Mask is Reusable
4. We can also use this mask to avoid second hand smoking.

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