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FORMATION OF SILICA GEL AND GAS POLLUTANT ADSORPTION

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Abstract - *Silica gel along with Purafil, molecular sieves, and activated carbon helps in removing of NO_2, SO_2, O_3, HCHO, and H_2S from a micro environment. The most common industrial adsorbents are activated carbon, silica gel, and alumina, because they have enormous surface areas per unit weight. The real toxin discharges of the diesel motors are particulate matters, smoke and the oxides of nitrogen (NOx). Out of these poison outflows, the oxides of nitrogen are considered as the most hurtful contaminations to the human wellbeing. Outflows of nitrogen oxides (NOx) contribute truly to air contamination, which is a noteworthy natural issue of NOx respond with dampness noticeable all around to shape nitric corrosive, adding to soil and water fermentation in touchy ranges. We know contamination now days is a noteworthy issue on the earth and huge numbers of researchers have done different strides to lessen the contamination and counter the evil impact of pollution.*

Key Words: (*nitrogen oxides* ,Size 10 & Bold) Key word1, Key word2, Key word3, etc (Minimum 5 to 8 key words)…

1.INTRODUCTION

At the point when a gas or vapor is carried into contact with a strong, some portion of it is taken up by the strong. The particles that vanish from the gas either enter within the strong, or stay outwardly joined to the surface. The previous wonder is named ingestion (or disintegration) and the last adsorption. The most well-known modern adsorbents are enacted carbon, silica gel, and alumina, since they have huge surface regions per unit weight. Enacted carbon is the widespread standard for cleaning and expulsion of follow natural contaminants from fluid and vapor streams. Carbon adsorption frameworks are either regenerative or non-regenerative. Regenerative framework normally contains more than one carbon bed. As one bed effectively evacuates poisons, another bed is being recovered for sometime later. Non-regenerative frameworks have more slender beds of initiated carbon. In a non-regenerative absorber, the spent carbon is discarded when it ends up plainly immersed with the poison.

1.1 Practical implications

This product can be used in general household gas stoves and in rural areas where wood is still used as a fuel.It has a also an another pratical application as it can be used in catalytic converter to reduce exhaust emission.It can also be used in various industries as a bed of meshes to reduce harmful emissions.It has also an another application as the carbon collected can be used again to make ink for printers and other uses and the product can be used again for future uses.It can also used to remove impurities from air as it removes impurities like carbon ,hydrogen,nitrogen,sulphur .It can also used in industries as a paste as in incinerator or it can be used as a bed of silica gel nano particle coating to get rid of exhaust gasses and harmful gasses and to make environment safe.

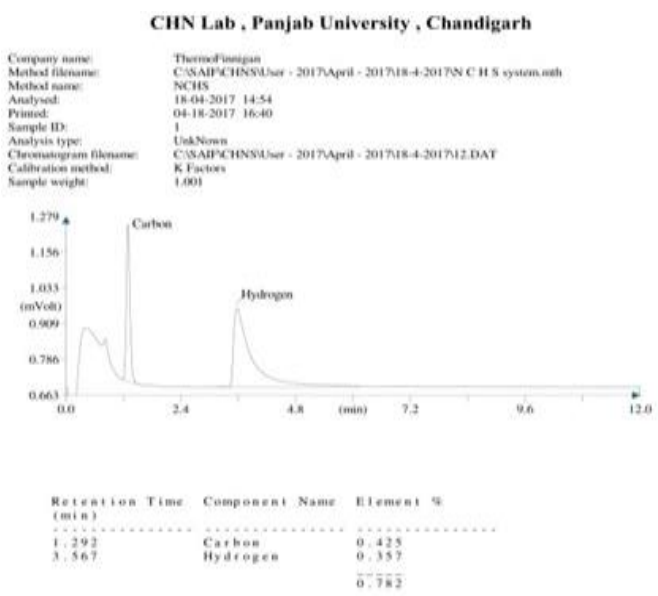
1.2 EXPERIMENTAL PROCEDURE

Silica gel was prepared by using sodium silicate and Sulphuric acid (100 ml).Sodium silicate is to be added till the ph of sulphuric acid reached ph 3. Base NaOH was also used in case we want quick results. After preparing the silica gel it was kept in steel container and washed with water after every 24 hours for 3 days and kept in oven at around 110 degree Celsius. Then the silica gel is prepared by this process. Synthesis of Silica Get using Sodium Silicate and Sulphuric acid Silica gels were prepared by sol-gel method 100 g of Sulphuric Acid with specific gravity of 120 was taken into a beaker fitted with a stirring arrangement. Sodium silicate of specific gravity 1.18 was slowly added into the beaker containing sulphuric acid with constant stirring_ When the pH of the hydrosol reached 3, the addition of sodium silicate was stopped (20-22 minutes). Afterwards hydrosol was poured into a stainless steel tray which was slowly converted into hydro gel after a few minutes at room temperature. Gel was cut into small pieces Fresh water was then added to the hydro gel and it was left for overnight stay The water containing hydro gel was replaced again and again with fresh water in order to remove Sodium sulphate formed during the reaction The process of removal of sodium sulphate from the hydro gel took 36-40 hours. The washing of the hydro gel was necessary to get optimum yield and good quality product The product becomes powder on drying if washing was not done An washing, the prepared gel was dried in an

oven at 110°C for 6 hours. On drying, the product disintegrated into transparent structure of various sizes depending on the experimental conditions.

Fig 1.

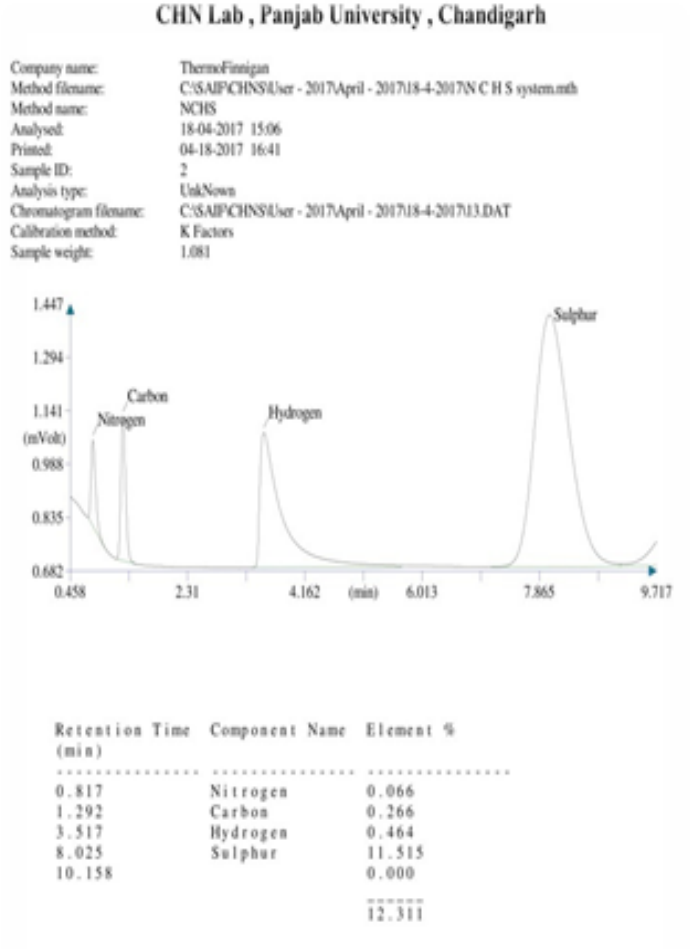
Fig2.



Conclusion 1.

We had done 3 tests on silica gel by burning various sources like wood, charcoal and wood charcoal and petrol. Here in the first sample we only used wood to test it as wood is the most common fuel used in villages and rural areas. We were sure that it can capture carbon but it can also capture sulphur and other gasses. The first graph shows that silica gel can adsorb carbon and hydrogen up to certain limits. It has a tendency to capture carbon up to 6 weeks on average use and 4 weeks on extreme uses.

Fig 3.



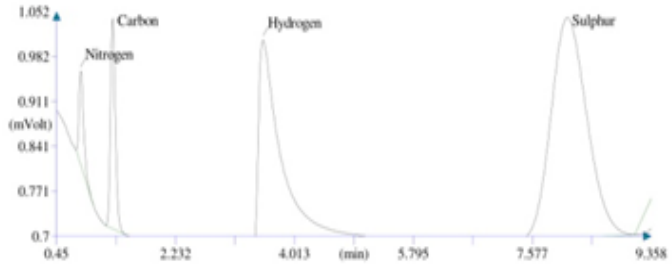
Conclusion 2.

Here we used wood charcoal and petrol and the results were far from average. It has a tendency to adsorb nitrogen and sulphur beyond a good limit. It shows that silica gel had a good adsorbtion rate and can be easily used in any circumstances. It can also capture sulphur and nitrogen which is a positive point for us and industries.It has a power to capture to carbon and carbon can be used again after extraction and silica gel can be used again effectively

Fig 4.

CHN Lab , Panjab University , Chandigarh

Company name:	ThermoFinnigan
Method filename:	C:\SAIF\CHNS\User - 2017\April - 2017\18-4-2017\N C H S system.mth
Method name:	NCHS
Analysed:	18-04-2017 15:18
Printed:	04-18-2017 16:41
Sample ID:	3
Analysis type:	UnkNown
Chromatogram filename:	C:\SAIF\CHNS\User - 2017\April - 2017\18-4-2017\14.DAT
Calibration method:	K Factors
Sample weight:	1.144



Retention Time (min)	Component Name	Element %
0.808	Nitrogen	0.000
1.292	Carbon	0.175
3.542	Hydrogen	0.348
5.550		0.000
8.100	Sulphur	5.151
10.283		0.000
		5.674

Conclusion 3.

Here we used charcoal only. As charcoal has more sulphur content when burnt so we tried to test it with every rural area and industrial areas fuels. It shows that it can adsorb carbon and sulphur also so it can be used easily in industries as it helps in reduction of pollution. It can be a revolutionary step in industries and rural areas as due to its low cost and effectiveness. It can adsorb gasses for long time and they can be used again by various methods and silica gel can be used again with its 90% efficiency again.

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