

# Production of Carbon Nanotubes using Chemical Vapour Decomposition Process

Dr.M.Arivalagan, R.Sriram

Professor, M.Tech-Student,

Dept. of Chemical Engineering, Kongu Engineering College, Erode.

## Abstract

*This paper discuss about the production of nano tube using the chemical vapour decomposition method. In this process the nano tubes will be a horizontal tube flow reactor and it will use the feed stream of acetylene and hydrogen. It will also discuss about the gas phase velocity and the temperature and the concentration of the chemical components. And it will provide the remarkable chemical, electrical, mechanical and thermal properties of the carbon nano tube in which the finished product will be fill for the each and every fields. It will be proposed as the potential methods for the carbon nano tubes which provide the simplicity in the structure and will create more compatability in the finished product.*

**Keyterms :** Nano tubes, chemical vapour decomposition, yeild.

## I. INTRODUCTION

This paper will speaks chemical vapor decomposition process of carbon nano tubes will form the non reproducibility structure of carbon atoms which will have the bonding configuration themselves. This structure is referred as isomers which themselves has the capacity of producing the nonlinear structure of carbon atoms. Since the large number of hydro carbons will use the non uniform product distribution in the chemical reaction. In this process the carbon nano tubes will be divided into two main categories. In the first category the carbon nano tube will be combined with the other materials to form the combinational satisfaction of the other engineering applications like mechanical, thermal, electrical properties. In the second category it will provide the quantum property based on the size of the carbon nano tubes.

## II. EXISTING SYSTEM

In the existing system the nano tubes will be used for only one field. It will particularly used for any of the field will be used purposely designed for the specific process. It will be used for the some other process rather than that. Before the production of nano tube they use the fibre tubes in the electrical will for the connection, communication and the transfer of data. It does not have the control over the process and it will not have the energy efficiency for the production of the different products. The fiber tube will provide many disadvantage process for the data transmission and other process. Therefore the process

will enter into a new technology of the nano tube production which will provide the better performance in the every field.

## III. PROPOSED METHODOLOGY

In this proposed system the nano tubes were produced using the method of vapour decomposition process. In this process it will use the allotropies of carbon particles and it will be thick sheets of carbon which will be made up of graphites. Since carbon is the sixth element in the periodic table it will have the six electrons which will heavier wave structure. The six electrons in the carbon will form the hexagonal structure. The wave formation will, under gone some hybridization process with which have the appropriate transmission control over the transmission media. This structure is called as honey comb lattice and it will form the analytical and the novel structure. This structure will be used in the many engineering applications for the data transmissions and other purposes.

## IV. SYNTHESIZATION PROCESS OF CARBON NANO TUBES

There are three main synthesization processes in this chemical vaporization decomposition technique. They are arch discharge, laser vaporization and chemical vapour decomposition. In this the elements used in the every process will be same and it will be differed only in the finished products. In this arch discharge method it will uses the two electrodes for the communication process. In the laser vaporization technique it will uses the optical light for the communication and the energy transmission. In the chemical vapour decomposition technique it will use the chemical substances for the communication this will be create more feasible environment for the energy transmission and the data communication.

## V. PRODUCTION OF NANO TUBES

The nano tubes was produced based on the three process

- Physical process
- Chemical process
- Miscellaneous process

Based on these three processes the nano tubes will be produced under CVD.

## VI. PHYSICAL PROCESS

In the physical process it uses the arc discharge techniques. In this the tubes were produced under the evaporation process it will have the carbon needles which will range up to 4 to 30 nano meter in length. In this the arc was generated using the DC current and it will use the three components for the synthesization they are argon, methane and iron.

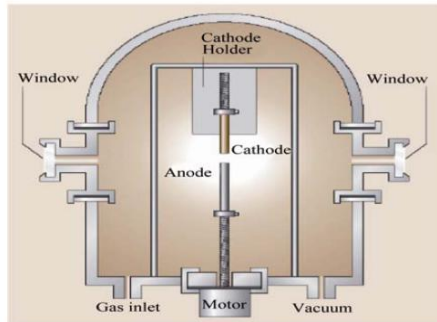


Fig 1: CNT Production Using Ad Method

## VII. CHEMICAL PROCESS

In the chemical process it will use the chemical vapour decomposition method which will provide the potential energy for the communication and the data transmission process. This method is capable for controlling the growth of carbon nano tubes in every field. The catalyst of the carbon nano particles which will be deposited as the substrates of electron beams evaporation. The catalyst will be used in the nano tubes will be depends upon the diameter of the nano tubes and the process taken over during the chemical reaction. Also it will be used the plasma assisted CVD this will give the new structural and behavioral patter for the carbon nano tubes.

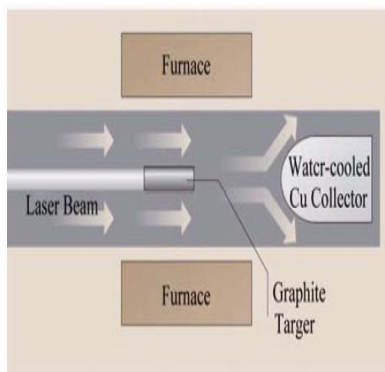


Fig 2: Chemical Process

By adjusting the geometric reactor for the plasma assisted membrane structure this will provide the free form catalytic support for the carbon nano tubes this reaction will be operated continuously by the process to form the efficient hexagonal chain structure to form the carbon nano tubes. After that both the process of hydro carbon catalyst was fed into the furnace for the catalytic reaction. In this process the carbon gas will be react with the hydrocarbon gas

to form the penta carbonyl which will speed up the process that will extended to form the SWNT. The material that is produced after the chemical reaction will be distributed for the various processes. And the sample will be tested for the various terms and conditions.

This is the only process that is capable of creating the carbon nano tube directly with the substances. Instance there are some refining will be required.

## VIII. MISCELLANEOUS PROCESS

In this miscellaneous process it is relatively low in the production of the carbon components. In this process it will use the helium discharge method, Electrolysis method and Flame synthesis method. In this the vaporized and amorphous carbon rod will be used to form the carbon nano tubes.

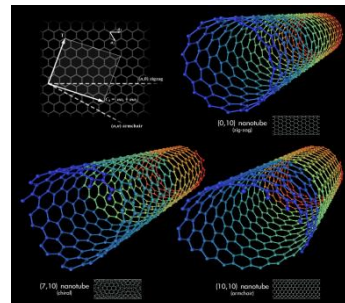


Fig 3: Nano Tubes

This will not be capable to transfer the data efficiently for the communication process. Also it will break the carbon bonding between them. Therefore it is a tedious process for producing the carbon nano tubes which will be used for the every application in every engineering field.

The chemical vapour decomposition process will yield the good quality of carbon nano tubes. And it will be scalable and very reasonable for the large scale production method. In this the hydro carbon will decomposes with the catalyst substrate and carbon diffuses through metal.

The nano fiber will be formed by the decomposition methods. The membranes of the nano fiber will be activated by either iron or carbon which will give the better yield for the nano tubes. The multi walled carbon nano tubes will be produced by the plasma process that will be useful for the electron fabrication process. Since the carbon consists of six electrons in the periodic table it will form the hexagonal honey comb structure which will be perfect formation for transfer the data.

The carbon nano fiber will be formed by the ethylene which will have some microscopic defects and it will produce more efficient and in the large variation of the nano particles the catalyst will be

formed. The lateral size of particles will be formed to form the thickness structure of the nano tube to communicate the data.

Among the three processes the chemical process is the feasible and optimal process for the production of nano tubes that will be used for the every application.

### IX. CONCLUSION

This paper provides the solution for the production of nano tube using the chemical vapour decomposition technique. In this process the both the arch discharge and the laser decomposition technique will have the several disadvantages. And the chemical vapor decomposition technique were used and it will be tested using the differ sample process and various catalytic process. It will be used for the data transmission process and the communication process in every field. It will be induced to be used in every application were ever the transmission of data needed. The chemical vapour decomposition method is the best suited economic method for the production of higher rate of carbon nano tubes. It will be the continuous process for the higher yield. Also the miscellaneous process will be used in missiles and satellite launching to provide the higher transmission rate. Also economically the chemical vapour decomposition method is called as double walled carbon nano tubes. This paper will also provide the solution for the new process that will be more useful to the environment economically.

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