

Synthesis & Characterization of Carbon Nanostructures.

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Abstract**Synthesis**

In this research a study was conducted on the Synthesis and dimensional structural characterization of nanostructures consisting of Graphene, Nanotubes and Fullerenes C60 and C70 carbon research project consists of a synthesis and characterization in its theoretical and experimental framework to test yields in the synthesis of each nanostructure. Synthesis for Multiple Synthesis Rector MSR will be held in the exploder and electric fields in the toroidal coil Tesla coil. As for the structural dimensional characterization of nanostructured materials carbon is carried out by Raman spectroscopy, diffraction X-ray (XRD) and Transmission Electron Microscopy (TEM) Scanning Electron Microscopy (SEM) Atomic Force Microscopy (AFM) and EELS (Energy Electron loss Spectrum).

Justification Synthesis System

The main justification synthesis system is to generate nanostructures (Nanotubes, Nanofibers, Fullerenes, graphene) easily and economically; all using little equipment and a simple process which is reflected in lower costs simple synthesis as current processes are very expensive and too complex.

Justification Synthesis System

The main objective of this system is the generation synthesis of nanostructures by using a Tesla coil (Plasma Generator) as the main component of the system being accessible, simple and inexpensive technology.

Another goal is to optimize the generation of nanostructures to its widespread use in industry, nanotechnology and materials science. Through a system very inexpensive and simple synthesis.

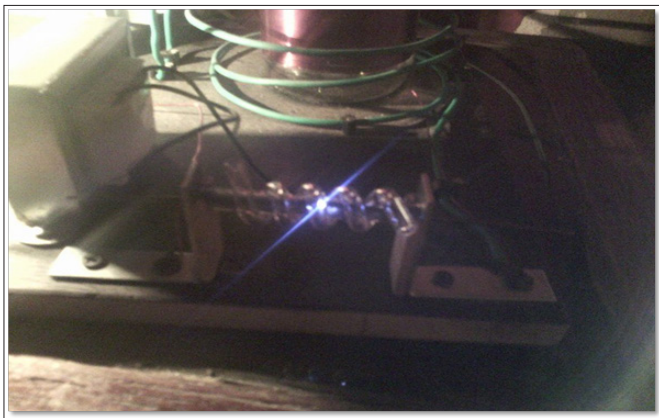
Description of The System Synthesis

The synthesis system is a system of simple structure that consists of a Tesla coil as the main component which will be the central element that will generate the plasma, the prototype is assembled by placing the Reactor Multiple Synthesis (Multiple Synthesis Rector MSR) equivalent to the quartz tube used in current synthesis processes. in the exploder of the Tesla coil; in which solid graphite electrodes so nanostructures synthesis is by the discharge of the high voltage plasma producing electrodes spark coil 50 Kv Tesla be placed. You can also be placed in grade graphite fine powder or solid multiple electrodes in the electric field and plasma generated in the toroidal coil to 100.250 or 500 KV.

Advantages of System Synthesis

The main advantage of this system synthesis is the economic cost of production, and therefore the low cost of essential operation for the production of carbon nanostructures and even other types of nanostructures of other elements stanene, Silver Metal Oxides or compounds so that the use and the low cost of maintaining it become widespread because it is a very simple system.

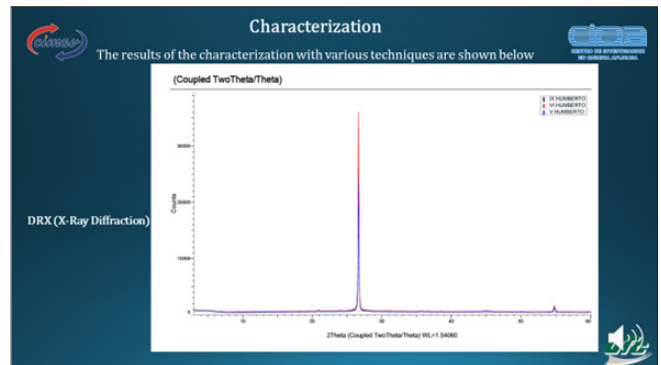
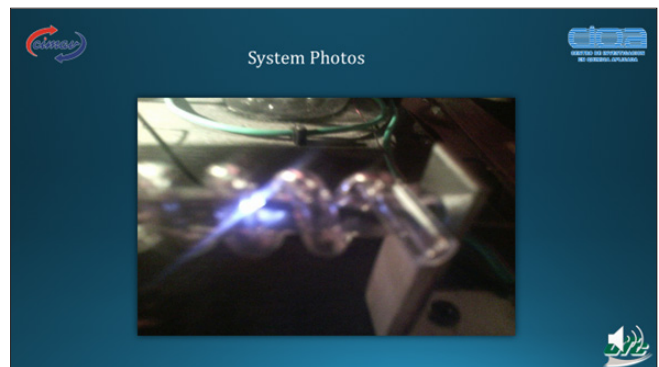
System Photos



Synthesis Statistics
Table-1

1 st Week	2 nd Week	3 rd Week
6.7 mg.	54.1mg.	9.9 mg.
14.4 mg	11.3 mg	8.8 mg
67.7 mg	60.7 mg.	12.6 mg.
6.1 mg.	24.4 mg.	62.1 mg.
24.4 mg.	23.4 mg.	10.9 mg.
$\Sigma=119.3$ mg.	$\Sigma=173.9$ mg.	$\Sigma=104.3$ mg.
$\bar{x}=23.86$ mg	$\bar{x}=34.78$ mg	$\bar{x}=20.86$ mg
$\sigma=22.89$ mg	$\sigma=24.14$ mg	$\sigma=20.65$ mg

Total Synthesis/ 3 Weeks ($\Sigma T=397.5$ mg) Mean Synthesis/day ($\bar{x}=26.5$ mg.) $\sigma=22.56$ mg



Studied Materials

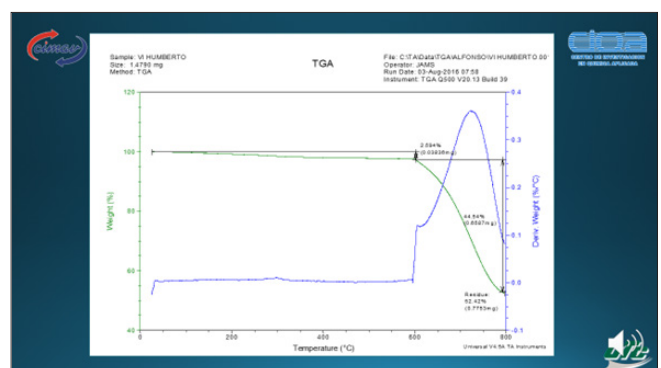
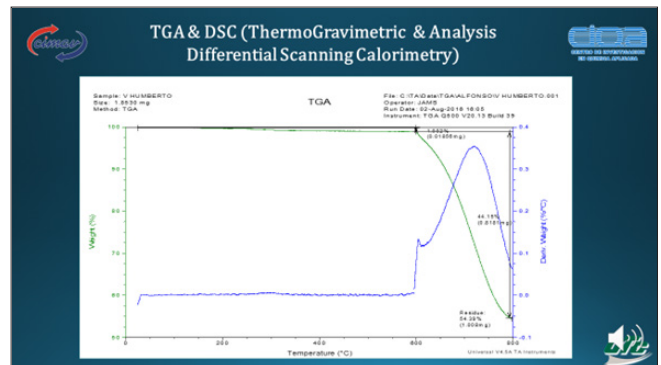
The main precursor material are cylindrical graphite bars that will be used for the synthesis of carbon nanostructures (graphene, Nanotubes, Fullerenes and Nanotors).

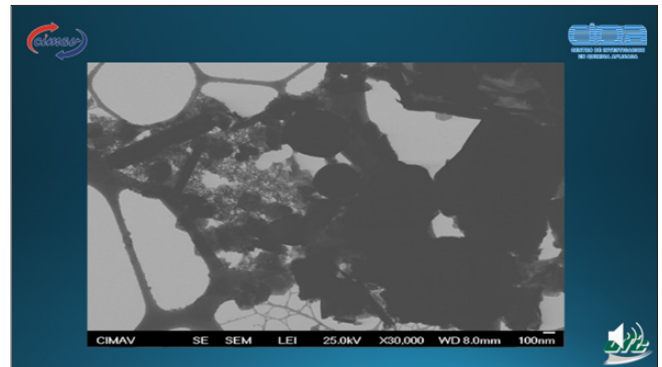
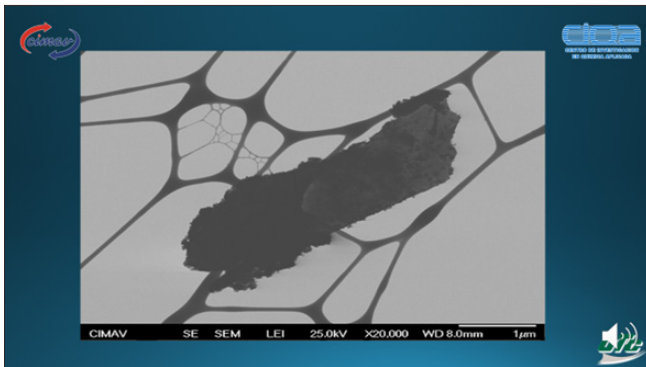
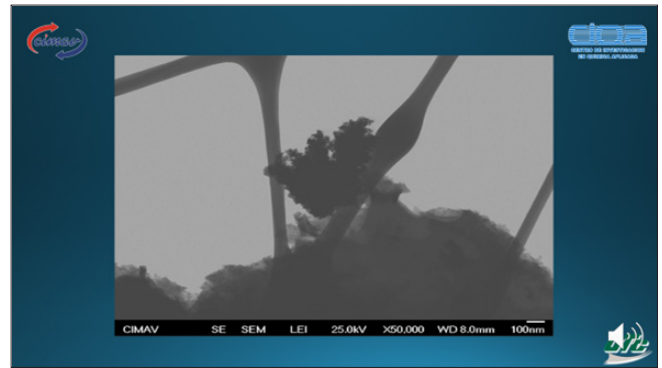
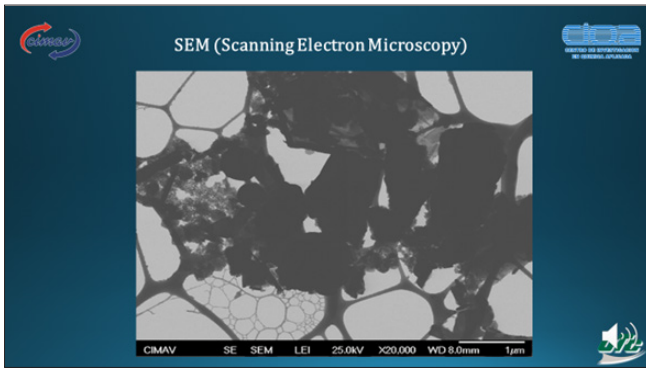
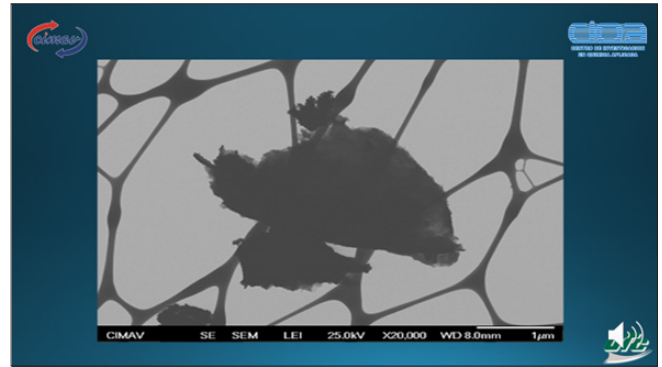
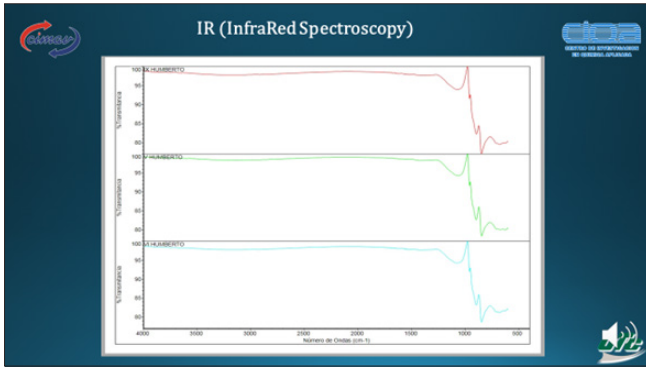
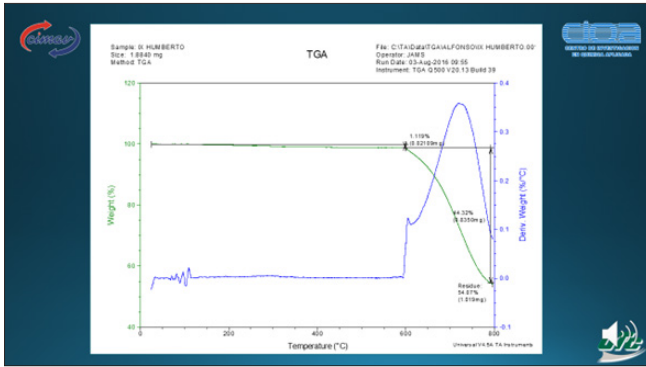
Synthesis Methodology

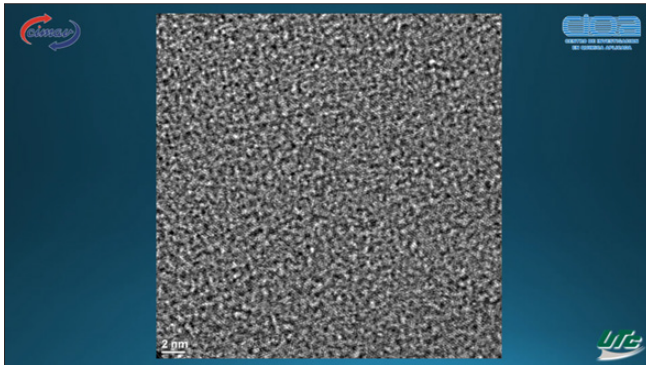
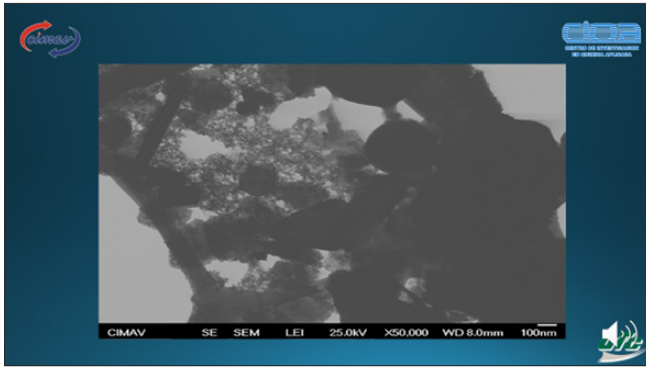
In the synthesis of nano carbon structures (graphene, nanotubes, fullerenes and nano bulls). A Tesla coil will be used which generates the plasma and electric fields.

The structures are obtained as an ultrafine powder in the explosion of the Tesla Coil and in the electric field that is produced in the upper part of the secondary coil or in toroidal coil to optimize the rearrangement and performance of the carbon nanostructures.

The table 1 below shows the statistics of the synthesis that was carried out over three weeks. Y shows the statistical variables, mean, standard deviation and their respective means of each week and that of the total of the synthesis.







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