Carbon nanomaterials present unique properties and characteristics. Carbon Nanotubes (CNTs) have high aspect ratio that allows them to be used as reinforcement material. Carbon Nanobeads (CNBs) are principally used due to its specific surface areas and conductivity. Their applications include catalyst carriers, lubricants, drug delivery vehicles and high capacity batteries. The aim of this research was to evaluate the morphology and crystallinity of CNTs and nanobeads obtained by chemical vapor deposition. The synthesis was carried out in a quartz reactor using benzene as organic precursor and ferrocene as catalyst precursor. The experiments were held for one hour at 760 °C temperature with 85 ml/min argon flow. Different samples were taken for the substrate and the inner part of reactor. Morphological analysis was performed separately for CNTs and nanobeads by Field Emission Scanning Electron Microscopy; the carbon nanotubes diameters were around 60 nm and their lengths above 30 µm. Energy dispersive spectroscopy analysis for nanoparticles showed a carbon content over 94%. X-Ray Diffraction analysis and the Scherer and Bragg equation were used to determine crystallite size and interplanar distance. The interplanar distance (002) for nanobeads was 0.341 nm and 0.339 nm for the CNTs. The crystal size for CNBs was 14.096 nm and for the CNTs 12.517 nm. The analysis was performed for all diffraction peaks; thus, demonstrating that the major crystal size corresponds to the carbon nanobeads. 

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**Keywords:** Carbon Nanotubes, Carbon Nanobeads, X-Ray Diffraction

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