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Synthesis Of Carbon Dots From Leaf of Murraya Koenigii (Curry Leaves)

Preeti Nitin Joshi
Applied Science & Humanities
Parul University
Vadodara, Gujarat India

Bhargav Rana
Student, Industrial chemistry
Parul University
Vadodara, Gujarat India

***Abstract*— Murraya koenigii also distinguishes as curry greenery trees and one of the most valuable plant of India and sri lanka. We created carbon dots (CDs) using a hydrothermal process from a natural source, the leaves of Murraya koenigii (curry leaves), to enable the selective and accurate detection of Cd2+ ions. Ligand-metal charge transfer was the cause of the fluorescence quenching of CDs (LMCT). The created CDs can form a chelate and lose some of their fluorescence intensity by donating an electron pair to the Cd2+ ions unoccupied excited state d-orbitals. Photoluminescence, UV-visible spectra, zeta potential, XRD, FTIR, and lifetime decay studies were used to characterise the manufactured CDs.**

Keywords*— *Murraya koenigii, CD'S

I. INTRODUCTION

CARBON DOTS

The carbon dot, which reveals the carbon size are smaller than 10 nm, was un intentionally found during the separation and purification of single walled carbon nanotubes [1]. The first synthesis of CDs, also known as carbon quantum dots or carbon nanoparticles (CNPs), occurred in 2004 [2].

CDs are of interest to scientists due to their superior photo stability, goodlow toxicity, high water solubility, and biocompatibility [3]. CDs are often amorphous and nanocrystalline pseudonanoparticles that invariably contain sp2/sp3 carbon, oxygen/nitrogen-based groups, and post-modified chemical groups [4].

The majority of synthesised techniques are still in the early stages of development, and issues with nanoparticle stability and aggregation, control of crystal growth, morphology, size, and shape dispersion of sizes. However, green manufacturing of nanoparticles has gained popularity recently, due to their high stability and rapid production, plants are a key source of concern for academics. C-dots are presently thought of as excellent supplies for use in bio imaging, bio sensing, drug administration, photovoltaics and optoelectronics systems [5-14].

Since a long time ago, quantum dots have been used in bio imaging; nevertheless, toxicity issues have forced their replacement with C-dots [18].

Because of their fundamentally non-toxic composition, C-dots can be utilised in bio analytical tools. The cytotoxicity of C-dots is believed to be extremely low, and it has been demonstrated that they internalise cells by an endocytosis mechanism. In a recent work, it was demonstrated that C-dots might be coupled with plasmonic metal nanoparticles to increase their brightness and photo stability. Better detectability in bio analytical applications is a result of this. Because they are easier to produce, organic optoelectronics are preferable to inorganic ones. For this technique to achieve the criteria for commercialization, further efficiency improvement is required. The efficiencies of polymer solar cells and light-emitting diodes were increased by silver nanoparticles supported by C-dots [14].

Green chemistry was employed to guide the synthesis process, and the starting components were accessible, cost-effective, and environmentally benign. The entire process took less time. The acquired C-dots had a high water solubility. C-dots suspended in a clear yellow suspension were first seen in visible light. When examined using ultraviolet light, they were very luminous and fluoresced green.

MATERIALS AND METHOD

Plant Material and Extraction Curry Leaves were gathered on the side of the road .The leaves were separated from the steam in the laboratory and cleaned with water before being treated with Deionization water to eliminate dust and impurities.

A home mixer grinder used grind to curry leaves into a paste. The curry leaves paste that was produced was extremely soft and fine. It was manufactured specifically a very thin paste so that when combined with Deionized water, the substance completely disperses and we can extract the most carbon from the Curry leaves.

The number of carbon dots extracted will be less if the paste's consistency alters or if the Curry leaves paste has a flaky appearance, which would reduce the potential for removing the curry leaves carbon level. Consequently, we decided to make a very fine paste that is thick. The following stage involved combining 800 ml of Deionized water with 150 grams of curry leaves

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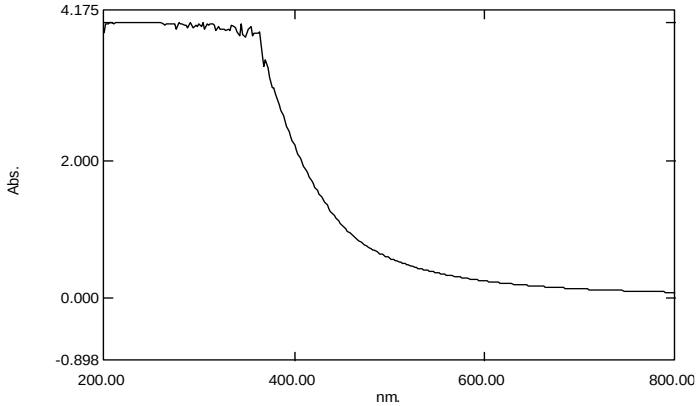
paste. This combination was then heated for 4 hours at 180 ° C. and 1500 rpm on the hot plate and magnetic stirrer, respectively. A normal household tea filter and filter paper were used to filter the solution

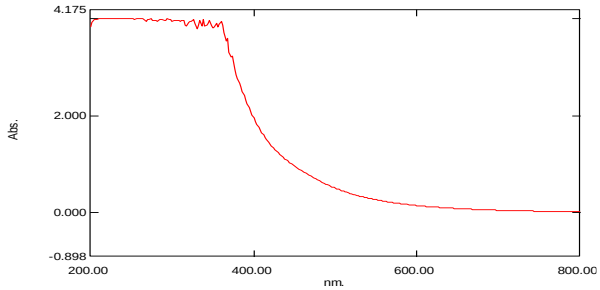
RESULTS AND DISCUSSION

CHARACTERIZATION OF CARBON DOTS
UV-VISIBLE SPECTROSCOPY

1 . ETHYLENE DIMINE



PHOSHORIC ACID



CONCLUSION

Carbon dots (CDs) have demonstrated great photostability, biocompatibility, minimal toxicity, and outstanding solubility for sizes smaller than 10 nm. The hydroxyl, carboxyl, or epoxy groups found in the manufactured CDs. are created by the oxidation of aliphatic chains from oligosaccharides different carbon sources or precursors that adhered to the CDs' surface. The organic material has frequently served as a carbon source in the production of CDs made from fruit, plant parts, corms, blossoms, greeneries, and other plant by products. Because it is convenient, eco-friendly, and affordable, the hydrothermal approach has received the greatest study attention. Numerous industries, medication delivery and catalysts, use CDs because of their advantageous features. The green synthesis method of Carbon dots are reported in this article. The particle was created by "MURRAYA KOENIGII" extract. The synthesis of carbon dots from grass using NaOH, KOH, Ethylene diamine, Phosphoric acid and DI water etc. This carbon dots are characterized by various technique like UV-Visible, IR spectra. The conformation of IR spectra of carbon dots are 3345.68, 1077.60nm etc. The key functional group present in the carbon dots samples were determined using IR tests as a qualitative analysis. Wide bands in the 3300-3500 cm-1 range were observed in carbon dots samples, indicating hydroxyl group O-H stretching, 3345.68nm and 3328.28nm respectively. At 1077.60nm C=O stretching occurs in primary amide. At 1630.03nm C=C stretching occurs in alkene. These dots are used in medical and pharmaceutical work and also lots of application with these dots.

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