

# ECONOMICAL SYNTHESIS OF CARBON NANOPARTICLES

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## ABSTRACT

A simple green approach that employs a domestic pressure cooker as an inexpensive hydro-thermal reactor for the batch synthesis of water-soluble, photo-luminescent nano-scale carbon dots derived from inexpensive commercial starting materials. The resulting carbon nanodots had the capability of stable, excitation wavelength-dependent fluorescence and were biocompatible with mice embryonic fibroblast cells. The bright fluorescence from the carbon nanodots made them great candidates for cellular imaging agents and were proven as such.

These nanoparticles were also selective towards certain metal ions, particularly the copper ion,  $\text{Cu}^{2+}$ . A fluorescence-based detection of the copper ion was utilized with the result of a detection limit lower than 6  $\mu\text{M}$ . Safety limit set by the U.S Environmental Protection Agency is 20  $\mu\text{M}$ .

These results illustrate that a household pressure cooker can be utilized as a cost-effective hydro-thermal vessel relevant to the synthesis of nanocarbon particles which creates greater avenues for resource limited institutions.