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White emission of carbon quantum dots obtained from the avocado peel

The aim of this work is to obtain fluorescent white light from quantum dots processed from avocado peel with different thermal treatments and mixtures.

The initial process consist in dehydrating the peel with sunlight for a week. After that, it is grounded and separated into three groups to apply different heat treatments in two of them, being 100°C and 200°C.

Three suspensions containing concentrations of 0.2 g were prepared for each powder with different treatment and 30 ml of ethanol.

Finally, different mixtures were made between the suspensions with powder without heat treatment and with 200°C in different proportions, being 25% - 75%, 50% - 50%, 75% - 25%.

Ultraviolet-visible absorption spectroscopy (UV-vis) and fluorescence spectroscopy were performed on all concentrations and mixtures. Two excitation sources were used for fluorescence spectroscopy, a UV lamp at 370 nm and a UV laser at 405 nm. X-ray diffraction spectroscopy (XRD) and infrared spectroscopy (IR) were performed on all powders obtained.

It was found that the flurescent color obtained closest to being white was the mixture of powder without heat treatment and 200°C at a proportion of 25% - 75%.

Keywords

White emission, quantum dots, fluorescence spectroscopy, UV, thermal treatments

Reference

Kang, C., Huang, Y., Yang, H., Yan, X. F., & Chen, Z. P. (2020). A review of carbon dots produced from biomass wastes. *Nanomaterials*, 10(11), 2316.

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Author approval

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