

## How Could A Waste Become A Resource? The Case of Kiwi Peels' Application for Synthesizing Nanomaterials

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### Extended Abstract

During the last decades, in accordance with the Circular Economy principles, an alternative life for wastes has been considered for transforming them into value-added products, and thus as resources. Basing on these premises, this work aims to exploit a one pot green approach for synthesizing gold nanoparticles (AuNPs) by using Kiwi peels "wastewater" (KPWW).

In detail, Kiwi peels were repetitively washed in hot water for finally obtaining a polyphenolic water-based extract needed for the AuNPs synthesis, in which polyphenols exhibited their role as reducing and stabilizing agents.

A preliminary characterization of the obtained AuNPs by using UV-Visible and ATR-FTIR spectroscopic measurements, TEM, DLS and Zeta Potential analyses [1, 2] was achieved (Figure 1). Furthermore, HPLC-MS measurements will be performed for exploring the main findings of the polyphenolic extract.

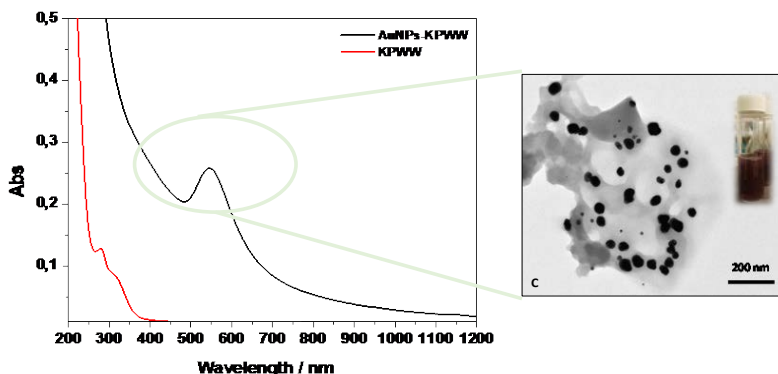


Figure 1: UV-Vis spectrum of AuNPs-KPWW overlapped with that of raw Kiwi peels' wastewater extract (KPWW), and TEM micrograph of the synthesized AuNPs-KPWW.

For assessing the stability of AuNPs after their synthesis, the physico-chemical parameters such as pH, ionic strength, and temperature were varied.

These hybrid nanostructures could find application as multifunctional platforms both in biomedicine, for photodynamic and photothermal therapy, as well as in cosmetics, due to their antioxidant, and skin-lightening properties [2]. For demonstrating the latter purposes, the 2,2-Azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) diammonium salt (ABTS), 2,2-diphenyl-1-picrylhydrazylhydrate (DDPH), and the tyrosinase-inhibition assays, respectively, were accomplished. Additionally, with the aim to propose these AuNPs as potential sunscreen ingredient, their photostability was also explored at different irradiation times by using a solar simulator lamp.

*In-vitro* evaluations about cells' viability when in presence of AuNPs will be also assessed in the next future.

## References

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