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Biowaste-Derived Substances As a Tool For Obtaining Magnet-Sensitive Materials for Environmental Applications in Wastewater Treatments

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## **Biowaste-derived substances as a tool for obtaining magnet-sensitive materials for environmental applications in wastewater treatments**

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### **Abstract**

In this study, bio-based substances (BBS) obtained from composted urban biowaste are used as stabilizers for the synthesis of magnet-sensitive nanoparticles (NPs). The BBS-stabilized NPs are characterized by means of different techniques (FTIR, XRD, SEM, BET analysis, magnetization curves). Additionally, TGA coupled on-line with FTIR and GC/MS analysis of the exhausted gas are performed in order to simultaneously identify all the degradation products and evaluate the exact composition of such BBS-stabilized materials. Moreover, Fenton-like or photo-Fenton-like experiments carried out at circumneutral pH are performed in order to evaluate the BBS-functionalized NPs photo-activity towards the degradation of caffeine (taken as model emerging pollutant). The obtained promising results encourage the use of BBS as a green alternative tool for the preparation of smart materials with enhanced magnet-sensitive properties, also suitable for applications in wastewater purification treatments.

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