

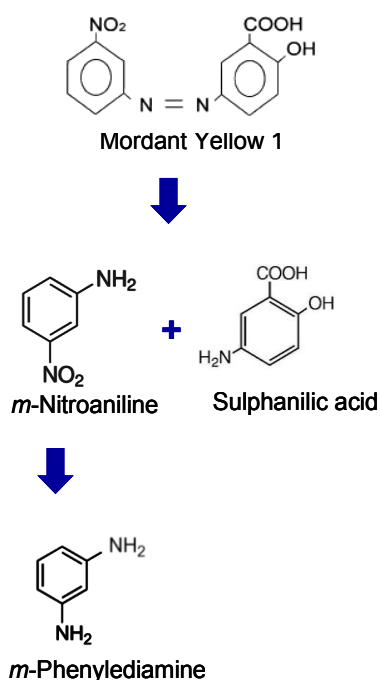
# CM@MNP composites for the biodegradation of organic compounds

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The ability of different Carbon Materials (CM), including Activated Carbon, Xerogels and Nanotubes, to accelerate the chemical and biological reduction rates of dyes and aromatic amines, and their advantages in comparison with soluble electron shuttles, such not needing to be constantly dosed, due to being continuously regenerated in the process, was previously demonstrated [1-3]. Though, powder CM is tricky to retain inside continuous reactors due to their low density. The talent of Magnetic NanoParticles (MNP) as strong reducers also enables their use in the remediation. In this way, our investigation aims to combine both materials to create a CM@MNP composite with synergistic properties by integrating the high catalytic activity and magnetic character. Combining materials is advantageous to exploit new applications and minimize cost.



## KEYWORDS

- Magnetic nanoparticles
- remediation
- catalytic activity

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## REFERENCES

- [1] Pereira L et al. 2010, J. Haz. Mater 183: 931–939.
- [2] Apostol L C et al. 2012, Biodegradation 23(5): 725-737.
- [3] Pereira R et al. 2014, Appl. Cat. B: Environm. 144: 713–720.

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# NANOPARTICLES FOR SOIL REMEDICATION

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100 nm

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