Structural, optical and photocatalytic properties under UV-A and visible lights of Co-, Ni- and Cu-doped ZnO nanomaterials. Comparative study

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**Supplementary data**



**Figure S1.** XRD patterns of the synthesized pure and metal ion-doped ZnO nanomaterials.



**Figure S2.** Full scan XPS spectra of the undoped and doped ZnO nanomaterials.



**Figure S3.** XPS spectra of Zn2p in the synthesized undoped and doped ZnO nanomaterials.







**Figure S4.** High resolution XPS spectra of O1s in the synthesized doped ZnO nanomaterials.



**Figure S5.** Distribution of particle size determined using a granulometric method for the doped ZnO nanomaterials.



**Figure S6.** MO photolysis under UV-A and visible light



**Figure S7.** Plots of ln(C0/Ct) as a function of irradiation time under UV-A and visible light in the presence of undoped and doped ZnO nanomaterials. C0(MO) = 10-5 M, mphotocatalyst = 0.5 g L-1, pH = 4.