Supporting Information

To demonstrate the surface charge of the Cr_2O_3/ZrO_2 nanocomposite, the zeta potential at various pH is measured to elucidate the isoelectric point of the photocatalyst, as shown in **Figure S1**, with an isoelectric point at pH 6.22. The enhanced photocatalytic degradation of TCL at pH 5.0 is attributed to the strong electrostatic interaction of the positively charged surface of the Cr_2O_3/ZrO_2 photocatalyst, with the anionic tetracycline drug molecule. Beyond the isoelectric point (> 6.22) the decline in photocatalytic drug degradation efficiency is attributed to the electrostatic repulsive between the negatively charged photocatalyst surface and the anionic tetracycline drug molecules.

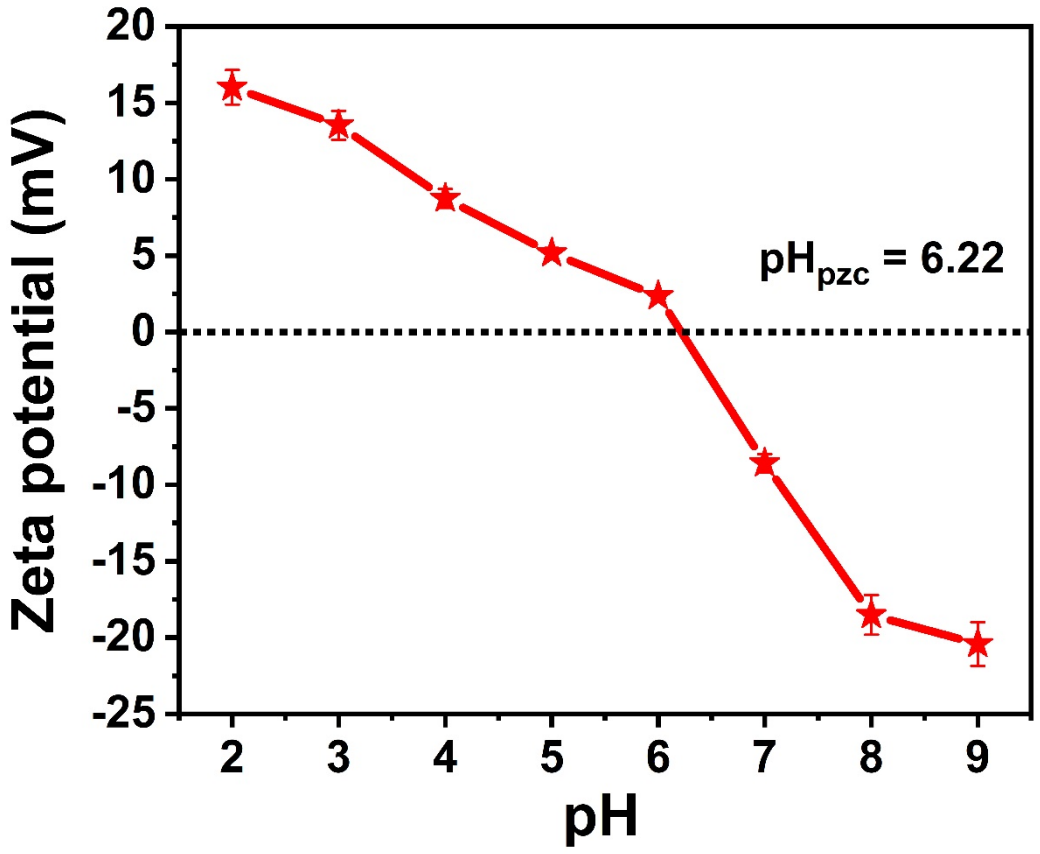

Figure S1. Zeta potential vs pH for Cr_2O_3-ZrO_2 nanocomposite

Radical quantification

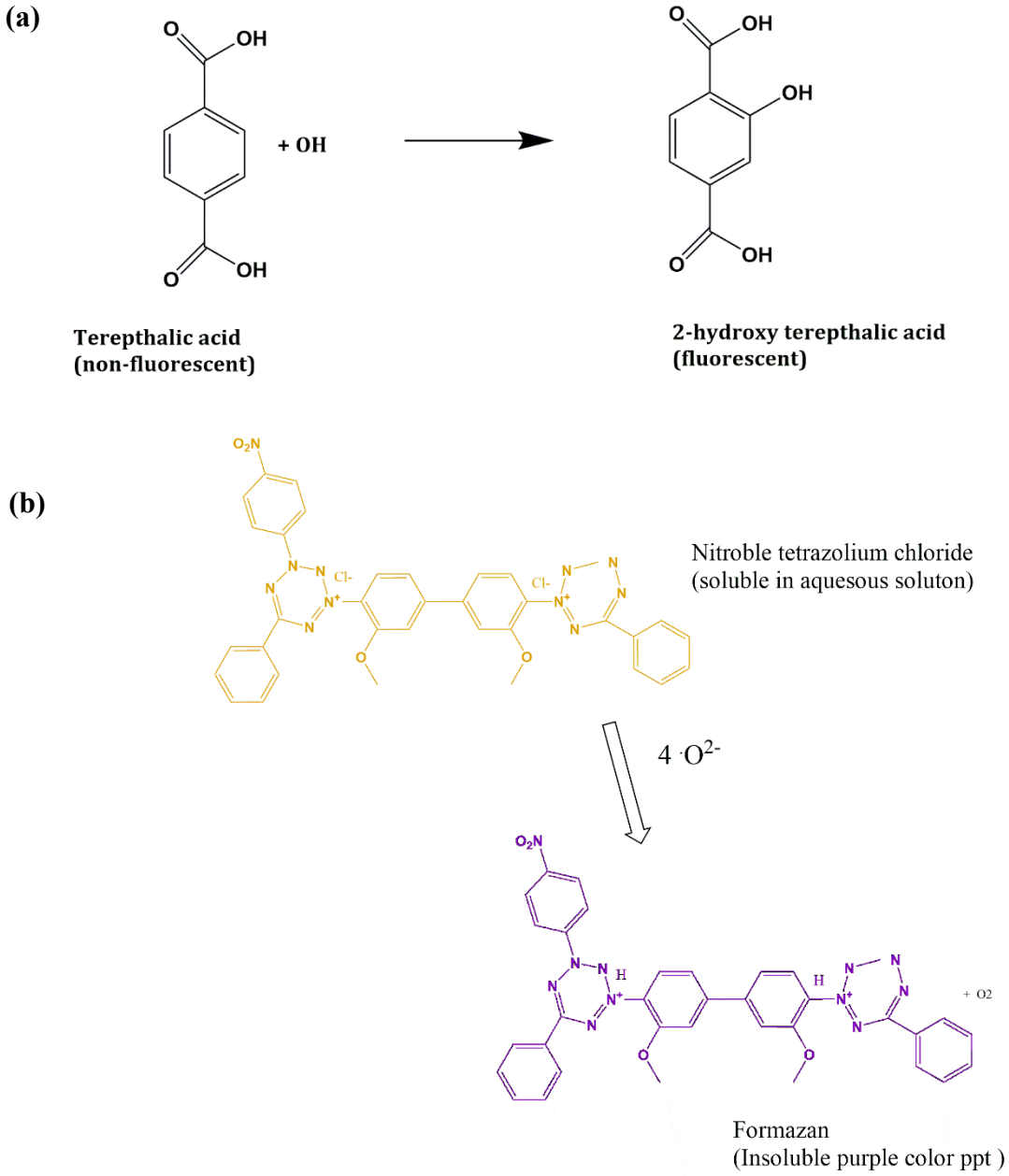

Figure S2 (a) Reaction pathway between terepthalic acid and hydroxyl radical with the formation of fluorescent 2-hydroxy terepthalic acid (b) Reaction pathway between NBT and superoxide radicals with the formation of formazan