The effect of Ce promoter on the performance of TiO_2 supported transition metal oxide catalysts for wet oxidation of phenol

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Wet air oxidation is the liquid phase oxidation of organics at elevated temperatures (125-320℃) and pressures (0.5-20 MPa) using molecular oxygen as oxidant. Wet oxidation is suitable for the treatment of the wastewater which is too concentrated and/or toxic to be treated with biological approach because any organic compound could be ideally mineralized to the desired end product by wet oxidation. In this work, the TiO2 supported transition metal (Mn, Fe, Co, Ni, and Cu) oxide catalysts were prepared and the activity and the mineralization selectivity of those catalysts were compared for wet oxidation of phenol. Ce was co-impregnated with the transition metal to enhance the activity of transition metal oxide catalysts. The carbonaceous deposits on the catalyst surface were confirmed with TPO/MS and quantified with EA.