

## Liquid-phase oxidation of phenol over metal oxide catalysts on titania: Effect of ceria addition

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Wet air oxidation (WAO) is an effective technology for the treatment of organics in industrial wastewater particularly for concentrated and/or toxic effluent. Application of the proper catalysts for WAO, i.e. catalytic wet air oxidation (CWAO), not only reduces the severity of reaction conditions but also decomposes even refractory pollutants. Generally, the noble metals show excellent activity but they are vulnerable to poisons and expensive. Transition metal oxide catalysts are widely studied as an alternative in the CWAO even if they show rather lower activity than noble metals. In this work, ceria, which is known to promote the redox property of many catalysts for catalytic oxidation, was used as a promoter and its effect on the performance of the transition metal oxide catalysts supported on titania in the CWAO of phenol was investigated with respect to reaction rate and selectivities of the converted phenol to intermediates, carbonaceous deposits, and carbon dioxide. Although the introduction of ceria enhanced the reaction rate, it simultaneously increased the amount of carbon deposits on the surface of catalyst, which is one of the main factors of catalyst deactivation.