CH_4 production over $Ni/Ce_{(1-x)}Zr_{(x)}O_2$ catalyst from hydrogenation of CO_2

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Carbon dioxide (CO_2) is considered as one of the great contributor on global warming. Since industrial revolution, continuous development of technology and high quality of life have resulted in an increase of carbon dioxide emissions in atmosphere. Accordingly, environmental problems such as climate change and sea level rise caused by the growth of CO_2 concentration are emerging as global issues. Recently, much attention has been focused on the technology which can transform CO_2 into CH_4 by using Ni catalysts. Ni based catalyst most commonly applied on C1 chemistry has been used for CO_2 methanation. In the aspects of catalytic activity and selectivity, supported-Ni catalyst shows highly improved performance compared to any other transition metal catalyst, but it is still insufficient for industrial application. In this study, we prepared a series of Ce-ZrO_2 supported Ni catalysts and tested their catalytic performance for CO_2 methanation. Through this study, the optimal ratio of Ce/Zr is confirmed.