Improving the catalytic activity of supported metallocene catalysts: A highly activated $(nBuCp)_2ZrCl_2$ catalyst using one-pot method

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The developments on supported metallocene catalysts continue to surge with a target of producing a highly active catalyst for olefin polymerization. In this study, a facile and efficient technique of supported metallocene catalyst preparation is presented utilizing SiO_2 supported $(nBuCp)_2ZrCl_2$ catalyst. One-pot method has cultivated the synergistic effect of using polyethyleneimine(PEI), tris(pentafluorophenyl)borane, and methylaluminoxane(MAO) on the activation of metallocene catalysts. The synthesized SiO_2/(PEI+MAO+Bor+Met) catalyst has shown a remarkable 8.9 and 11.4 kg-PE/g-cat·hr activities for homo- and copolymerization, respectively. Furthermore, the supported metallocene catalyst was characterized using SEM, XPS, FT-IR, and ICP analysis.