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Gasification of Cellulose over Rh/CeO₂/SiO₂ Catalysts: Combustion of Coke and Reforming of Tar

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The conventional methods for biomass gasification to hydrogen and synthesis gas are carried out at high temperature. Recently Rh/CeO₂ based catalysts has been shown to be very effective for the catalytic gasification of cellulose at low reaction temperatures. The catalyst performance of Rh/CeO₂/SiO₂ catalysts was investigated using a continuous feed fluidized bed reactor and cellulose as a model compound of biomass. The performance of the Rh/CeO₂/SiO₂ catalysts was very dependent on the loading amount of CeO₂, so the optimum loading was determined. Furthermore, analysis of the product distribution over various catalysts suggests that coke is removed by combustion with oxygen and tar is converted to synthesis gas *via* the reforming reaction. The low temperature catalytic gasification of cellulose requires high catalyst activity for combustion and reforming, and our optimized catalyst showed adequate activities for both reactions.

Keywords: [Cellulose](#), [Biomass](#), [Gasification](#), [Rhodium catalyst](#), [Cerium oxide catalyst](#), [Synthesis gas](#)



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