Thesis Title	Coal Steam Gasification in Up Draft Gasifier
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Abstract

Gasification is the process of thermal conversion to convert solid fuel to producer gas. The quality of obtained producer gas can be improved by steam gasification process.

In this thesis, a model of reduction zone from up draft gasifier is constructed to study the reaction of coal gasification and coal steam gasification. Simplex search method is applied in the experiment. The parameters of this experiment are temperature and carbondioxide flow rate. It is found that the optimum condition of coal gasification are temperature of 875°C and carbondioxide flow rate of 121.25 cm^3/min which result in maximum of producer gas 91.26 % with HHV 9551.81 kJ/m^3.

With the optimal condition, the steam injection is added in coal gasification with steam flow rate 10, 20 and 30 cm^3/min. It is found that carbomonoxide maximum of producer gas is obtained at steam flow rate of 20 cm^3/min. The average producer gas HHV is 10551.86 kJ/m^3. It can be concluded that coal steam gasification can improve the quality of producer gas HHV increasing 10.46 % .This process seems to be a viable option where steam is available such as industrial plants.

Keywords : Coal / Steam Gasification / Producer Gas / Simplex Search Method