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Titel des Beitrags:
Influence of pressure, temperature and steam on tar and gas in allothermal fluidized bed gasification

Abstract:
Gasification is considered to be a promising way to use biomass with high efficiency in combined heat and power production, for the production of second generation biofuels and in the chemical industry. Especially allothermal fluidized bed steam gasification produces a medium calorific, nitrogen free gas suitable for a variety of downstream processes. In general the raw product gas has to be cleaned from condensable hydrocarbons (tar) and conditioned (e.g. adjustment of the H2/CO-ratio) before downstream use. The operating conditions of the gasification reactor have a large impact on the quality of the product gas. Hence first steps to a product gas low in tar content can be undertaken directly in the reactor. In this study the capability of influencing the tar content and gas composition by changing temperature (750°840 C), steam to biomass (S/B) ratio (0.8?1.2) and pressure (0.1?0.25 MPa) in an allothermal bubbling fluidized bed steam gasifier is investigated. It is found that rising temperature reduces the total tar content and affects especially heterocyclic and light aromatic compounds. At atmospheric pressure the naphthalene content increases slightly with increasing temperature in contrast to pressurized gasification where naphthalene decreases significantly with increasing temperature. An increase in the S/B ratio leads to a decreasing total tar content, this tar reduction according to a higher steam content is higher at higher temperatures.
Increasing pressure leads to increasing total tar content mainly due to naphthalene, the effect is most distinct for low S/B ratios.