عنوان مقاله:

Sub-Critical Water Gasification of Biomass for Hydrogen Production – Gas Product Composition

محل انتشار:

پانزدهمین کنگره ملی مهندسی شیمی ایران (سال: 1393)

تعداد صفحات اصل مقاله: 5

نویسندگان:

Shayan Seif - *School of Chemical Engineering, College of Engineering, University of Tehran, Tehran, Iran*

Omid Tavakoli - *School of Chemical Engineering, College of Engineering, University of Tehran, Tehran, Iran*

Hossein Bahmanyar - *School of Chemical Engineering, College of Engineering, University of Tehran, Tehran, Iran*

Shohreh Fatemi - *School of Chemical Engineering, College of Engineering, University of Tehran, Tehran, Iran*

خلاصه مقاله:

Sub-critical water gasification of distillery wastewater has been reported in this article. Water acts as a strong solvent for organic compounds near and at its critical point (T=274.15 ºC and P=22.1 MPa) and becomes a suitable reaction media for reforming and gasification pathways. Distillery wastewater possesses a high level of COD, which makes it a potential source of wet biomass as a proper feed of sub- and supercritical water gasification. In this regard, a batch autoclave was used to investigate the effects of temperature, concentration and reaction time on hydrogen production. Gaseous product contained methane, hydrogen, carbon dioxide and carbon monoxide. Results clearly highlighted that by increase in temperature (300-375 ºC), H2 mole fraction in gaseous product increased, while CO2 mole fraction decreased. The reverse behaviour of mole fraction variation was observed by the effect of reaction time (15-45 min). Methane mole fraction was less than 1% in most cases and CO fraction was about 4-7% with low variations at all experiments. Moreover, the results showed that the amount of produced gas in terms of mole was directly related to both reaction time period and wastewater/water mass ratio; as 50% improvement of gas production was observed by .feed weight fraction increment from 20 to 40%wt

کلمات کلیدی:

Gasification, Hydrogen, Biomass, Sub-Critical, Water