Influence of pyrolysis pressure and heating rate on char reactivity

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Despite the global tendency, coal production in Russia exceeded 400 million tonnes in 2017 and exports increased to 185 million tonnes. In order to achieve higher efficiency of solid feedstock utilization, gasification technologies could be seen as suitable alternative for this market. Moreover, comprehensive evaluations for local bituminous coals with different approaches (chemicals, liquid fuels, power generation) should be mentioned [1, 2].

The present study focuses on the pyrolysis experiments with a similar bituminous coal (W=3.3%; A=16.95,07%; V=31.2%; C= 66.07%; H= 4.25%; N= 2.1%; S =0.63%; O=10,0%). The treatment of coal under slow and rapid heating conditions was performed in a TGA instrument. During a slow pyrolysis, the sample was heated up to a 900 °C with a heating rate 25 K/min. In contrast, in a fast pyrolysis conditions the sample dropped into the hot reactor. TGA experiments were carried out at atmospheric and elevated pressures under nitrogen atmosphere. The main purpose of investigations was to study of heating rate and pressure effects in coal pyrolysis and its impact on the char characteristics.

References