

Anastasia Subbotina
J.V. Shishko, research supervisor
I.P. Nikitina, language adviser
National Metallurgical Academy of Ukraine, Dnipropetrovsk

Co-Processing of Biomass and Brown Coal

Questions of energy-saving and environmental safety is becoming important now. Traditional fossil fuels are not renewable, mining them is expensive and they are environmentally unfriendly. That is why renewable energy is of current interest.

One promising area is the partial replacement of fossil fuels by biomass (straw, sawdust, wood chips, household garbage, sunflower husks, etc.). It would make possible significantly reduce the consumption of expensive fuels such as coal, oil or natural gas.

Coal mining is one of the basic branches of Ukrainian economy. Coal is an integral component of the electric power and metallurgy. The share of coal in the total amount of fossil fuel in the depths of Ukraine is 95%. The basic structure of coal: carbon, oxygen, hydrogen, nitrogen, sulfur, ash. Stages of metamorphism: peat, lignite, bituminous coal and anthracite.

Ukraine has a great potential for the production of biomass available for energy production from renewable sources. As Ukrainian experts think, biomass could provide about 8-10 % of the total primary energy demand. The use of such biomass corresponds to an increase of domestic production.

Analysis of published data showed that currently there are several ways of co-processing of coal and biomass: direct combustion, gasification, pyrolysis, etc. The most common and most studied is the co-combustion of coal and biomass. Now technologies of direct co-firing, indirect co-firing, parallel combustion of coal and biomass have been developed.

This paper proposes a co-processing of coal and biomass oxidative pyrolysis method. Compared with other methods, oxidative pyrolysis technology has several advantages over the widespread introduction process. It is not necessary to create complex systems sealed to implement this method of heat treatment; the process proceeds at relatively low temperatures (500 - 700 ° C) ; fuel gas and coke are products of processing. For co-processing brown coal is the most suitable.

Calculation of the volatiles was carried out on a one-component and two-component calculation schemes. According to both calculations a similar result was obtained more accurate is a 2 - component scheme. Brown coal will increase the duration of the process.