



DOCTORAL RESEARCH TOPIC:

Application of thermochemical processes for processing waste biomass and waste into valuable energy products and chemicals

RESEARCH FIELD:

Energetics and Power Engineering (T 006)

BRIEF DESCRIPTION OF RESEARCH TOPIC:

Thermochemical processes such as gasification and pyrolysis remain one of the more promising ways of recycling bio-waste and adapting the resulting products to the synthesis of alternative gaseous or liquid fuels. The biggest disadvantage of aforementioned technologies is the complexity of processes involving multiphase and complex chemical reactions, formation of unstable intermediates, and lack of heat / mass transfer efficiency. In order to optimize these parameters and obtain targeting products (methane, hydrogen, bio-oil, coal), various thermocatalytic methods are required. Thus, the main scientific objective is the sustainable study of the thermochemical conversion of biomass and other wastes using self- catalytic processes for the production of synthetic products.

During the study experimental gasification and pyrolysis studies will be carried out, which will apply stepwise self- catalytic thermal conversion of the selected feedstock, determine the composition, yield, dependence of process products, process pressure, oxidation or reducing environment. Detailed investigations of these processes will determine the optimum parameters of the thermochemical process at which the maximum yields of the target products will be achieved, as well as the dependence of the intermediate and final reaction products on the autocatalytic reactions.

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