

# Combustion of pellets from biomass and refused derived fuel

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Pelleted fuels are widely used to generate thermal energy in small boilers and household stoves. Most often, they are made from sawdust and other types of forestry waste. However, today the possibilities of expanding the component composition of pelletized fuels by involving low-grade components and various waste groups are being actively explored. In this work, the additional components in the production of fuel pellets are coal sludge, peat and a mixture of agricultural waste (rice husk and straw).

Fig.1 shows the ignition delay times of fuel pellets with the addition of coal slime (a), peat (b) and a mixture of rice husk and straw (c). Pellets without additives are characterized by minimal ignition delay times due to the highest content of volatiles in the sawdust composition. Among the considered additives, the minimum ignition delays were recorded for pellets with a mixture of agricultural waste due to the high content of volatiles, and, as a consequence, the high rate of formation of a vapor-gas environment at the stage of gas-phase ignition.

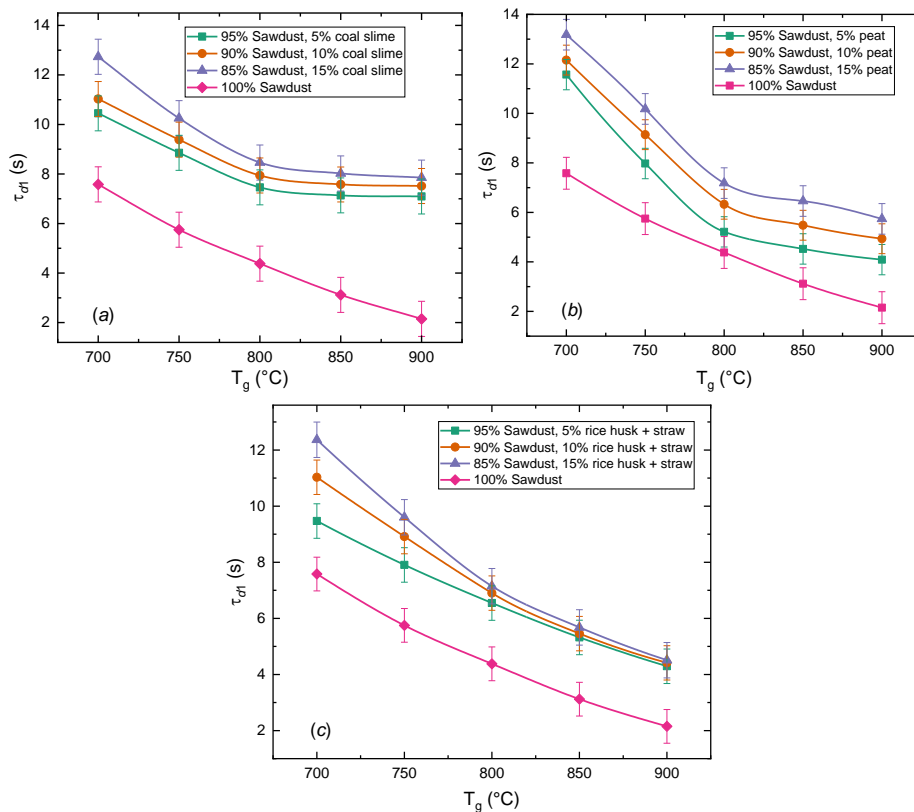


Fig.1. Ignition delay times of fuel pellets with addition of coal slime (a), peat (b) and rice husk + straw (c)

The greatest increase of ignition delay times with agricultural waste additives is observed in the temperature range  $700 \text{ °C} \leq T_g \leq 800 \text{ °C}$ . In this temperature range, an increase in the additive concentration from 5 wt% to 15 wt% led to an increase in the ignition delay time by up to 31%. In turn, at an oxidizing environment temperature of more than 800 °C, the difference in ignition delay times between pellets with different proportions of additives does not exceed 9%.

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