
APPLYING OF FALLED LEAVES IN PRODUCTION OF FUEL BRIQUETTES

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The possibility has been considered of obtaining of fuel briquettes as an alternative biofuel based on fallen leaves (such tree species as oak and maple) and starch. The starch (a binder) content at the level of 10-30 % allows to produce of the briquettes using a screw press at a pressure of up to 15 MPa. The process of fuel briquettes obtaining from fallen leaves and starch included the following successive stages: collection of raw materials; preparation; averaging; mixing; pressing; drying and the testing of the product properties.

At the last stage, the appearance of the obtained briquettes has been evaluated, and then their density (ρ , kg/m³), strength (P , MPa), working heat of combustion (Q , MJ/kg) and storage conditions have been determined. Evaluation of the appearance of briquettes showed that the correct geometric shape had those briquettes in which the weight content of the starch was in the range of 20-25 % to leaves weight.

It was found out that the maximum value of briquette density (580 kg/m³) and compressive strength (4,8 MPa) is observed in the fuel briquettes which contained 25 % of starch. That is, this concentration can be considered optimal for this technology for the production of fuel briquettes. At the same time, the increase of starch content in the fuel briquette leads to an increase its working heat of combustion, which at a starch content of 25 % reached the value of 17.8 MJ/kg.

It has been fixed that the influence of temperature (storage at 80 °C for 6 h) or temperature differences (from -10 to 25-30 °C) practically does not affect the form and properties of fuel briquettes obtained from fallen leaves. And the stay of briquettes in a humid environment, on the contrary, leads to its swelling, and, as a consequence, to the impairment of properties.

Keywords: fuel briquettes, leaves, starch, pressing, density, strength, heat of combustion, storage conditions.

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