Kajda-Szczesniak, M., Wandrasz, J.W. Effect of Plastic Binder Addition in the Course of the Forming Process on the Applicability of Straw Briquettes in Thermal Processes. Ochrona Srodowiska 2010, Vol. 32, No. 4, pp. 27–30.

Abstract: The study was conducted with briquette samples prepared from oat straw and a plastic material (low-density polyethylene, PE-LD) which acted as a binder. The upper limit of matrix heating was determined in order to obtain products of the mechanical strength desired. The thermal stability of the briquettes was related to the method of binder preparation. PE-LD was added either upon size reduction (mixed with straw and moulded) or without size reduction (in the form of a foil acting as an external shell around the moulded straw). The results of thermal decomposition were presented in the form of a TG curve (mass decrement related to the temperature of sample heating) and a DTG curve (rate of change during heating of the sample). Thermogravimetric analysis was supplemented with measurements of the emitted gaseous products that had formed during combustion of the oat straw + PE-LD briquettes: CO_2, SO_2, SO_3, NO and NO_2. The study has demonstrated that oat-straw plastic-bound briquettes can be used in households as a fuel for heating and cooking purposes. The fuel has the added value of reducing the volume of vegetable and plastic wastes produced.

Keywords: Oat straw, polyethylene, briquetting, formed fuels, thermal processes, thermogravimetry.