Introduction The use of wood pulp as an energy feedstock is rather vital. Effective and ecologically combustion of biomass in fuel devices determined by the characteristics of combustion mode. Important role today given the issues of using wood biomass, including fast-growing, as energy resources. In order to determine the combustion characteristics of wood biomass and setting the optimal parameters necessary the complex research. Investigation methods of burning process are the physical modeling on the laboratory and semi-industrial plants, with further full-scale tests of the developed flowsheets and analytically through the mathematical models. Analytical researches requiring information about the kinetic and thermal power characteristics of wood biomass. Should be noted that here possible significant reduction of substantial funds and resources expended in obtaining the necessary information from the relevant experimental setups [1-3]. Experimental To study the calorific value of wood used integrated thermal analysis, including thermogravimetry (TG), differential thermogravimetry (DTG) and differential thermal analysis (DTA). The objects of research were samples: stem wood of aspen (sample 1), stem wood of aspen, mixed in equal proportions from the bark of aspen (sample 2), aspen bark (sample 3). The age of aspen wood was 10 years. Thermal analysis of samples of aspen wood was performed on deryvatohraf Q - 1500D system "F. Paulik - J. Paulik - L. Erdey " with the registration of the analytical signal of mass loss and thermal effects using a computer. Samples of wood were analyzed in dynamic mode with a heating rate of 10 0C/min in air. The mass of each sample was 100 mg. The reference substance was aluminum oxide[4,5]. Results and discussion Thermograms of samples presented in Figures 1 - 2, and the results of their treatment - in Table 1. In Fig. 3 and 4 shows the comparison of TG and DTA curves of samples of aspen wood. a b Fig. 1 - Thermogram of the samples 1(a) and 2 (b) Fig. 2 - Thermogram of the sample 3 Table 1 - Results of comprehensive thermogravimetric and differential thermogravimetric analyzes of samples 1 - 3 Sample Stage Temperature range, 0C Loss of mass, % sample 1 1 20 - 187 7,6 2 187 - 277 19,5 3 277 - 372 43,3 4 372 - 569 28,5 sample 2 1 20 - 187 9,2 2 187 - 272 17,5 3 272 - 373 42,9 4 373 - 564 28,1 sample 3 1 20 - 186 10 2 186 - 277 20,4 3 277 - 383 31,2 4 383 - 624 32 Fig. 3 - TG curves of samples:1 - sample 1, 2 - sample 2, 3 - sample 3 At the 1st stage (20 - 187 0C) occur endothermic processes due to evaporation of chemically bound water and constitutional water. Intensive mass loss observed on samples of TG curves at temperatures higher 200 0C. At the second stage of thermolysis, which according to the differential thermogravimetric analysis takes place in the temperature range 186 - 277 0C, along with the endothermic dehydration and pyrolysis processes (cleavage of volatile degradation products), which are accompanied by a sharp decrease the degree of polymerization of cellulose, developing exothermic thermooxidative destructive processes, as DTA curve shows the course aspen samples (Fig. 1 - 2). Fig. 4 - DTA curves of samples:1 - sample 1, 2 - sample 2, 3 - sample 3 Unlike other samples of aspen, like sample 3 in the second phase of thermolysis most heavily lose mass (Fig. 3). This indicates that the sample of bark most heavily take place the processes of cleavage of volatile decomposition products [5-7]. The third stage of thermolysis (277 - 383 0C), accompanied by the largest mass loss of the aspen samples (Table 1) and the appearance of bright exothermic effect on the curves DTA, there are active thermooxidative destructive processes, accompanied by flame combustion of volatile decomposition products. For sample 3 thermooxidative processes in the air phase flow less intense. This shows a small weight loss of the sample and the appearance of the smallest compared with other samples, exothermic effect at the DTA curve. At the fourth stage of thermolysis (372 - 624 0C) occurs burning of the carbonated residue of aspen samples. For sample 3, which characterized by the largest coke residue heterogeneous oxidation process occurs most rapidly. This is evidenced by the appearance of the most striking in comparison with other samples exothermic effect on the DTA curve, which is shifted into the region of higher temperatures [5]. Chemical analysis of elemental composition of dry weight mixture of aspen wood: carbon - 52.65%, hydrogen - 4.38%, oxygen - 37.4%, nitrogen - 0.42%, ash - 1.5%, heating value is 18, 4 MJ/kg. Conclusions As seen from conducted thermal analysis the sample of bark has the highest heating value. The processes of thermooxidative degradation and burnout of carbonated residue is accompanied by largest exothermic effect. The results of mathematical modeling make it possible use them to develop effective constructions of appropriate fuel devices for efficient utilization of wood waste and wood biomass. During the combustion of biomass in power plants or boilers emitted only CO2 that will be absorbed by the plant during its growth.