

New methods of municipal solid waste disposal

Zaichenko V M and Pudova Ya D[®]

Joint Institute for High Temperatures of the Russian Academy of Sciences,
Izhorskaya 13 Bldg 2, Moscow 125412, Russia

[®] pudova.y.d@mail.ru

Municipal solid waste (MSW) is a mixture of solid waste generated as a result of human activity: food waste, paper, biomass, glass, metals, plastics, rubbers and textiles, which are currently disposed of by burial, composting and incineration. The development and creation of technologies that ensure environmentally friendly waste disposal is an important and urgent task of today.

A complex of research aimed at creating an effective technology for processing MSW by pyrolysis has been carried out at the Joint Institute of High Temperatures of the Russian Academy of Sciences (JIHT RAS). In the temperature range of 300-600 °C, an experimental study of the pyrolysis of MSW was carried out with the determination of the ratio obtained in the process of gaseous, liquid and solid phases. The main direction of utilization of pyrolysis products is their use as fuel. The results of experiments on the use of two-stage thermal processing of carbon-containing materials for the disposal of MSW according to the technology currently being developed at the JIHT RAS are presented. This process makes it possible to exclude the formation of a liquid fraction (resins) during pyrolysis. The resulting energy gas consists of 85-90% of a mixture of H₂ and CO. At the same time, in the gas phase of pyrolysis, as has been shown in experiments, up to 80% of the energy of recycled waste is accumulated. The data obtained indicate a sufficiently high economic and environmental prospects for using the technology of the Russian Academy of Sciences for the energy utilization of MSW. This work was supported by the Ministry of Science and Higher Education of the Russian Federation (State Assignment No.075-01056-22-00)