

ABSTRACT

At present era the energy from waste is very essential and useful technique to reduce the waste generated by the various factors like rapid urbanization, industrialization, increasing population and various manufacturing processes. These generated waste are mainly finding there way directly to the land, water, air respectively and causes environmental pollution by emitting the greenhouse gases. The waste generated by the agricultural activities are the major sources of renewable energy, every biomass waste contains a high amount of organic constituents (cellulose, hemicelluloses and lignin) which possesses very high energy content. Therefore biomass energy is recognize as a potential source of renewable energy. In the present work the tea factory waste was selected as an biomass sample, as we know that India is one of the major tea producing countries in the world, second in the world just after china. So at the time of tea processing period a huge quantity of waste is generated which are directly used as a manure to the tea cultivation field for the recovering of N,P,K. The TFW contains various other chemicals which can be recovered and reuse. This is a very good material for the production of activated carbon with good surface area and por volume. There are various waste to energy conversion techniques are there among them for the project investigation the thermal conversion technique was used. For the project investigation the biomass sample was pyrolysed in four different temperature and two different heating rates those were 400°C, 500°C, 600°C, 700°C and 10°C/min, 40°C/min heating rates. From the pyrolysis, bio-oil and biochar was obtained. Their characterizations was conducted and finally it was found that the bio-oil obtain was maximum at 500°C temperature and at 40°C/min heating rates. The various elemental analysis of bio-oil and biochar was analyzed. The SEM-EDX, FTIR and GC-MS analysis were also conducted at last it was found that TFW is a very valuable and reliable as a renewable resources. It has the capacity to value addition for the rural societies.

Keywords: Biomass energy, Tea factory waste, Pyrolysis, Bio-oil, Biochar.