

Boonya Charnnok 2007: Recovery of Plastic Wastes from Open Dumpsite as Refuse Derived Fuel. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering.
Thesis Advisor: Associate Professor Chart Chiemchaisri, D.Eng. 102 pages.

In this study, initiative effort to utilize solid waste at dumpsite as energy recovery by transforming them into refuse-derived fuel briquette (RDF) was performed and gasified to produce fuel gas. The excavated waste (2 to 10 years old) from dumpsite was determined for their physical composition and chemical characteristics. They were found containing plastic and soil like materials as their main components. The plastic content in waste bulk was determined as 14.64-44.83% of total weight in which plastic carry bag predominates other plastic forms at 11.92-23.38%. The plastic was purified by separating them from other waste components by dry process using manual separation and a trommel screen at average rate of 634 ± 114 kg/hr. After the screen separation process, plastic wastes were purified to 72.97-82.96%, shredded and mixed with cassava meal and formed into RDF briquette with plastic content of 55.56%. The produced RDF was mixed with cassava rhizome (1: 1) and gasified with down draft gasifier at supply air flow rate of 30 and 50 m³/hr. The energy content of produced gas was 1.49 and 1.76 MJ/m³, equivalent to 6.97 and 14.60 MJ/kg of fuel, yielding cold gas efficiency of 32 and 66 %, respectively. During the process, the cost of RDF production was determined as 8.39 baht/kg of RDF with of energy production cost of 0.49 baht/MJ or 13.67 baht/kg of RDF.

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