Design and Analysis the Organic Waste Decomposer for Fertilizer Production Using Thermal Energy from Large-Scale Magnetic Field Induction

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Abstract:

This research is related to the design of an organic waste digester that efficiently converts organic waste into organic fertilizer by using heat from an induction coil to transfer to a bioreactor tank. This system uses a heat source from an induction circuit with an efficiency of up to 81.3 percent, which is higher than the biomass burner and tungsten heating coil, which have efficiencies of 70 percent and 51.8 percent, respectively. It is also energy-saving and environmentally friendly. This system is designed to decompose organic waste into quality organic fertilizer. It is designed to be completed within 24 hours to reduce the problem of the increasing amount of organic waste and the damage to the environment by introducing moderate heat-loving bacteria to help decompose organic waste better. This system works with alternating current flowing through the induction coil to create a magnetic field that acts directly on the steel tank, which creates a vortex and generates heat inside the steel tank, speeding up the organic waste decomposition process. The goal is to reduce the processing time and improve the quality of organic fertilizer produced using large-scale magnetic induction technology. It can also be effectively applied in various types of heating in the industry.

Keywords:

Inductor, induction, waste, fertilizer, induction heating.