

## High efficiency carbonization and torrefaction of food waste using a microwave plasma burner

Dong Hun Shin, Se Min Chun, Geon Woo Yang, and Yong Cheol Hong  
 Plasma Technology Research Center, National Fusion Research Institute  
 e-mail (speaker): [shindong17@nfri.re.kr](mailto:shindong17@nfri.re.kr)

In South Korea, food waste represents a sizeable and largely underutilized component of Municipal Solid Waste (MSW). It has become the primary cause of odor among MSWs in the country. Furthermore, it is responsible for many of the peninsula's municipal waste management related environmental hazards. The LPG microwave plasma burner was presented as a tool for carbonization and torrefaction of food waste, which cause environmental problems. The microwave plasma burner operates by injecting LPG as a hydrocarbon fuel into a microwave plasma and by mixing the resultant gaseous hydrogen and carbon molecules with air. The moisture and organic compound contents of raw food waste were 83.91% and 9.48%, respectively. However, the moisture and organic compound after drying treated of food waste using a microwave plasma burner were 9.16% and 71.03% of carbonization, and 12.11% and 66.68% of torrefaction, respectively. The microwave plasma burner is much more efficiency effective, compact, and economic in comparison with other fuel burner.

### References

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### Figure

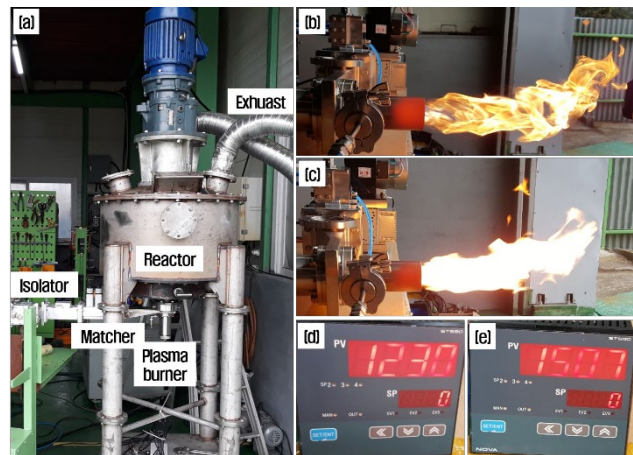


Fig. 1. Photograph images of (a) the torrefaction reactor with plasma burner system, (b) LPG burner flame, (c) LPG plasma burner flame, (d) temperature monitor of LPG burner, and (e) LPG plasma burner.