POTENTIAL FOR CONVERTING MSW TO USEFUL FUELS THROUGH PYROLYSIS

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Discussion by

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The paper by Mallya and Helt represents original research into an area which has not been the subject of much study to date. As such, the information presented is in the form of preliminary scientific research and lacks any discussion of direct applicability of the findings.

In this preliminary scientific paper, Mallya and Helt present some of the much needed basic facts regarding the behavior of some primary contents of MSW under pyrolysis conditions. The fact that the presence of polyethylene and aluminum do not significantly alter the characteristics of the chars produced is one important variable related to actual MSW that Mallya and Helt changed in their experiments. They also performed experiments under acidic conditions as would be expected with MSW and found these conditions unfavorable. There are many other variables which would have to be studied in this early experimental stage before further development can proceed. For instance, what effect would the wide variability in MSW moisture content have on this process, especially if some of the moisture is tightly bound within the MSW? What effect is likely from variability in the ash content and the content of the more minor components including nitrogen, sulfur, chloride, calcium, sodium, etc.?

Further development problems could be addressed as subsequent research and development in similar experimentation with actual processed MSW samples. Many practical considerations would be addressed in such subsequent studies; however, it would be helpful to get the authors' opinions on these issues. Such considerations include: the stability of the products of pyrolysis, the potential disposal problems associated with the by products of pyrolysis; the potential problem with odor control both during pyrolysis and while storing products of pyrolysis; and the potential handling difficulties of MSW feed, chars produced, and any by products of pyrolysis during pyrolysis of MSW.

Regarding the spectra shown in Figs. 2 and 3, the similarity between the spectra of kraft paper (KP) tar [Fig. 2 (a)] and kraft paper, polyethylene, and aluminum (KPPA) tar [Fig. 3 (a)] is remarkable. Do the authors have any possible explanation as to why KPPA and KP tars show nearly identical IR spectra and similar carbon/hydrogen/oxygen compositions but are so different in Btu value and physical properties? This is particularly interesting in that, in contrast, KPP and KPPA tars are similar in physical properties and BTU value but quite different in IR spectra and C/H/O composition.

In general, this paper is a good first step in understanding the basics of the behavior of MSW constituents during pyrolysis. Actual application of this process on a full scale is a long way off and it is even questionable at this point if pyrolysis of MSW to produce tars will ever be practical. That does not, however, reduce the need for initial studies such as this and subsequent research. Congratulations to the authors.