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PART 1:

Journal Name:	British Journal of Applied Science & Technology
Manuscript Number:	MS: 2012/BJAST/1984
Title of the Manuscript:	Pyrolysis of household plastic wastes

General guideline: Reviewers are requested to follow these guidelines during review: (Note: Title of different sections as proposed below may differ in case of review paper / case reports)

- Introduction (*Is the problem/objective of this study original, important and well defined?*)
- Materials & methods (*Kindly comment on the suitability of the methods. Sufficient details of the methods should be provided to allow peers to evaluate and/or replicate the work*)
- Results & discussion (Kindly comment on: 1. Are the data well controlled and robust? 2. Authors should provide relevant references during discussion. 3. Discussion and conclusions should be based on actual facts and figures. Biased claims should be pointed out. 4. Are statistical analyses must for this paper? If yes, have sufficient and appropriate statistical analyses been carried out?)
- Conclusion (*Is the conclusion supported by the data, discussed inside the manuscript? Conclusions should not be biased and should be based on the data, presented inside the manuscript only*)
- Are all the references cited relevant, adequate? Are there any other suitable current references authors need to cite?
- This form has total 10 parts. Kindly note that you should use all the parts of this review form.



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PART 2: Review Comments

	Reviewer's comment	Author's comment <i>(if agreed with reviewer, correct the manuscript and highlight that part and write here 'Corrected'/ if not agreed, give suitable justifications)</i>
<u>COMPULSORY REVISION</u> comments	INTRODUCTION The objective and interest of the work is neither original nor well defined. There are hundreds, even thousands of papers in the literature dealing with pyrolysis of plastic waste. If the words "pyrolysis plastic waste" are used for searching in scientific databases such as <i>Science Direct</i> or <i>Scopus</i> more than 8000 results are obtained. Well-known researchers in the field, such as Kaminsky, Williams, Roy, Pinto, Sakata, etc. are not mentioned neither in the introduction nor in the results and discussion section. The authors do not put forward which is the novelty or the interest of the paper. The paper does not contribute anything new to the field.	The comments of the reviewer is certainly helpful accordingly we did the following: a. Rewrote and changed introduction b. As we studied further the published materials we referenced those of major authors.
	MATERIALS AND METHODS The experimental procedure used is rather unsuitable for obtaining useful scientific results. Pyrolysis experiments were carried out with any control of temperature, heating rate or time. Each sample is just heated and the system evolves at its own pace, so that the experiments with the different samples cannot really be compared. Also for this very reason the results are neither scientifically sound nor useful for other researchers.	The procedures used in our studies were adequate for the purpose of the study which was to eliminate unwanted waste and convert them to useful materials.
	Concerning the GC/MS analysis, if the maximum oven temperature is 220 °C, those products with volatilization temperatures higher than 220 C will not be determined. An estimation of the proportion of such compounds should be provided.	All the liquid materials were collected under 175°C. Therefore, we do not expect to have materials with bp above 175°C. Moreover, GC-MS system worked under reduced pressure (6 Pascal); bp under reduced pressure is considerably blow bp at normal pressure.



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	RESULTS & DISCUSSION As above mentioned, the data cannot be considered sound or robust, since there is no control of the pyrolysis process. Additionally no estimation of the experimental error is provided; the repeatability of the results is quite questionable given the lack of control of the pyrolysis process used.	The results are within expectations for a simple reactor to convert waste plastic to liquids. They are consistent with the results reported by other researcher, therefore, they are reproducible. We did not do statistical analysis to calculate errors and other function related to it.
	There is some kind of incoherency between figure 5 and table 4. Different names are used for the waste materials in the figure and in the table. Moreover, as a matter of fact, the results reported in table 4 are not clear; what does “% remains” mean?. Also it is not explained why different materials are tested in TGA and in pyrolysis; which is the interest of providing the TGA analysis of samples which are afterwards not tested in pyrolysis?	This was corrected what does “% remains” mean? Means % left over Also, extra information was removed.
	Pyrolysis yields (wt % solid, liquid and gaseous products) should be reported; additionally some information about pyrolysis gases would be welcome.	We added a table concerning these matter. We did not study the nature of gases or solids leftovers.
	It seems that the authors do not have a clear idea of what char is. Char is a solid carbonaceous product, mainly composed of carbon, which is formed in the pyrolysis process of certain polymers. Char is neither tar, nor unconverted plastic. For instance plastic bags are usually made of polyethylene; this polymer yields almost no char in pyrolysis processes. The authors report 38% char for shopping bags in table 4; it probably is unconverted or partially decomposed polyethylene but not char.	We corrected those terms.
	The discussion of the results is very poor. It is just a mere account of the data obtained with no discussion and no deepening at all. There is no comparison between the results obtained in the different tests, and there neither is comparison with the results of the many references dealing with pyrolysis of plastics waste that can be found in the literature. Reasons for the results obtained are not put forward (e.g. relationship with the chemical structure of the polymer of the materials). Finally what is the main weakness of the results and	We worked on the discussions. The main component of plastic bags are PE, however, fillers and plasticizers are used to process PE. TGA results leaves ~30% solid material at 600°C for that particular plastic bags. We did not do TGA analysis of every type of plastic bags that we used. Relationship to the chemical structures were added.



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	discussion <u>section is that there is no indication of the interest, novelty or usefulness of the results presented.</u>	
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	CONCLUSIONS The conclusions section does not really contain conclusions derived from the authors' work. On the one hand some general and already well-known facts are reported (e.g. pyrolysis produces 3 phases, the yields depend on the feedstock, etc.) On the other hand statements of other authors and references are included. Additionally information about facts that have not been reported in the body of the paper is included (e.g. concerning hydrogenation of the liquids). Finally there is information which is more suitable for the introduction or the "results and discussion" section than for the conclusions section (e.g. concerning additives, concerning char; by the way, this latter is not correctly defined by the authors)	Thank you for the comments they were corrected.
	REFERENCES As has already been mentioned, there is a huge amount of references in the literature concerning pyrolysis of plastic waste, among which there are well-known researchers which should have been cited. On the contrary some of the references included are not essential, and as a matter of fact some of the references listed in the references section have not been cited in the text (e.g. lines 408, 417, 427)	We corrected them.
	There are some English errors all through the text, so a revision of the language is recommended..	We worked out in the body of the text.
	There is an error in the caption of Figure 1: it is called Figure 6.	It was corrected
	Each of the materials used for the experiments should be described, especially those for which it is not so evident what they are (cLEARAP, Fork silver, etc.). It is also recommended that the same name is always used for each product (soft and hard foam, hd foam, foam plate, shipping protection foam,...; so many different denominations is very much confusing, for instance in lines 232-233 it is reported that 3% char is left, but it is not specified for which material, and there neither is a material in table 4 with such char yield. Additionally it is	We worked within the text to address these problems



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	also recommended to indicate the main polymer that constitutes each of the materials; this information can be easily found in textbooks or can be obtained from the manufacturers.	
	It is advisable to arrange the component names of the GC/MS analyses by the retention time.	We rearranged the tables as was requested
	Figure 7a, 10, 11 and 13 (distribution of the chemicals) do not contribute nothing new to the paper, and besides they are very much confusing, so they should be deleted.	They were deleted
	Figures 8 and 14 are completely unnecessary. Figures 8 and 12 are neither essential	They were removed
Minor REVISION comments		