

Review Form 1.6

Journal Name:	Chemical Science International Journal
Manuscript Number:	Ms_CSIJ_88282
Title of the Manuscript:	RECENT DEVELOPMENT OF BIOMASS AND PLASTIC CO-PYROLYSIS FOR SYNGAS PRODUCTION
Type of the Article	Review Article

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments		
Minor REVISION comments	<ol style="list-style-type: none"> On what basis author choose plastic other than due to its abundancy. Is there any scientific explanation to justify it. Do not use abbreviation in abstract (etc CO₂). Please spell it out. What is the elemental composition of MSW that able them to be pyrolyzed to syngas. Do different sources of MSW gives different composition of MSW? Please elaborates more. A details discussion on the optimum parameters involves in production of syngas would be meaningful. The details on mechanism of co-pyrolysis of biomass and plastic materials releasing syngas would be more meaningful. Please draw the mechanism of action of co-pyrolysis process to make them more professional. More information about the analytical methods should be provided. Detail discussion on reactor configurations that affecting the pyrolysis performance would be meaningful. References not up to dates. 	<ol style="list-style-type: none"> The combustibility of biomass depends on carbon, hydrogen, and oxygen ratios. The carbon and hydrogen are oxidised in an exothermic reaction to form carbon dioxide and water, respectively, thereby affecting the properties of the syngas, especially, the heating value, during pyrolysis (Fernandes et al., 2013). To eliminate/minimise this, we chose plastic, e.g., PE (moisture-0.02; ash-0.15; volatiles-99.83; fixed carbon-0; C-85.83; H-14.38; N-0.16; S-0.07; and O-0) [Gholizadeh et al., 2020] with such rich physicochemical properties as a solution to enhance the syngas final properties. Thank you for pointing this out. It has been spelt out and highlighted yellow in the revised manuscript. MSW is composed of biomass/biodegradables, plastics, inert and miscellaneous (leather, rubber, textiles), paper/cardboards, metals, glass (Miezahl et al., 2015). The elemental/chemical compositions of biomass/biodegradables {moisture-4.92; ash-16.09; volatiles-64.68; fixed carbon-14.31; C-39.57; H-4.01; N-5.2; S-0.87; O-29.34; and heat content-15638J/g}; plastics {ibid}; inert/miscellaneous e.g., fabric {moisture-3.92; ash-0.84; volatiles-80.06; fixed carbon-15.18; C-55.26; H-4.54; N-1.84; S-0.16; O-33.44; and heat content-2126 J/g}; among others [Gholizadeh et al., 2020]. It should be emphasised that these parameters enable them to be converted to syngas and other valuable products. Different sources of MSW generation gives different composition of MSW. For instance, MSW composition from households is different from that of market waste, etc. The optimum production parameters for syngas generation including temperature, heating rate, residence times, and the use of catalysts have been discussed in the manuscript in sections 3.1 – 3.4. Please this has been included and highlighted yellow in the revised manuscript Please this has been included and highlighted yellow in the revised manuscript Please I have included section 2.6 which addresses the issue Thank you for pointing this out. However, the recent progress on pyrolysis reactor configuration have been excellently reviewed by other authors [Gholizadeh et al., 2020] and the reference to this material has been included in the revised manuscript and highlighted yellow as well. This has been updated and highlighted yellow, thank you. In all, there are 115 references. 52 are references between 2012 – 2017; 48 are references between 2018 – 2022; and 15 are references dated 2011 and below.
Optional/General comments		

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PART 2:

	Reviewer’s comment	Author’s comment <i>(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	- No