**Plastics production from biomass: assessing feedstock requirement**

* [I. Raphael](https://www.semanticscholar.org/author/I.-Raphael/118121937), [A. Yang](https://www.semanticscholar.org/author/A.-Yang/48400776)
* Link: Link: <https://link.springer.com/article/10.1007/s13399-013-0094-2>

Biomass, as an alternative and renewable feedstock, has recently received increasing attention in the process industry due to its potential in producing sustainable energy, chemicals and materials. The competing uses of biomass make it important to understand the feedstock requirement for each purpose in order to quantify the true potential for replacing fossil-based feedstocks. Focusing on bio-based plastics, this work attempts to estimate the percentage of lignocellulosic agricultural residues and woody biomass residues resulting from logging and wood processing that is required for producing five main plastics (polyethylene, polypropylene, polyvinylchloride, polystyrene, polyethylenetherepthalate) world-wide and in Europe. The theoretical yields of three different production routes, namely direct fermentation, syngas fermentation, and chemical synthesis, are calculated, and the gap with the realistic yields is considered. The analysis shows that the chemical synthesis route and the syngas fermentation route for converting lignocellulosics to plastics are more productive than the direct fermentation route and have the potential to produce ethylene and propylene required by these plastics by consuming 28–47 and 48–80 % of the considered feedstock available world-wide and in Europe, respectively, for meeting the corresponding demands. It also reveals the challenges in feedstock sufficiency for the production of benzene and terephthalic acid (as plastics components) from lignin.