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David A Schiraldi

Case Western Reserve University, USA

Green materials-Which are really green?

Materials that come from nature – green, yes? Remember that Rayon comes from nature, but requires extremely hazardous processing solvents; not so green! So, how does one separate reality from hype? What are the key requirements for “green”? Several current examples, and trends to look for in the future, will be presented: I hope to provoke your thoughts, and the conversation throughout this conference (and beyond). Poly(lactic acid) is widely touted as a green, bio-based, and biodegradable polymer. This material is indeed produced from corn (hence from carbon dioxide); one has to consider its impact on the food chain (not as profound as the impact of bio-ethanol fuels, however), and it is also important to understand that its biodegradation occurs only under very specialized conditions of composting. Poly(butylene succinate) is an emerging plastic produced from tropical grasses, potentially competing with traditional injection molded resins. Isosorbide from corn, vs. furan dicarboxylic acid from agricultural waste, vs. bio-based ethylene glycol from tropical grasses as components for soft drink bottles? The furan dicarboxylic acid building block may exhibit low toxicity, but a related monomer, furanyl alcohol can be dangerous to work with, so bio-based does not always equate to non-toxic. Many significant opportunities for taking advantage of waste materials exist and will become evident in the coming decade, but one needs to examine the full system and societal costs in assessing opportunities.

Biography

David A Schiraldi has completed his PhD in Chemistry from the University of Oregon and worked in the chemical/polymer industry for 20 years, then moved to the Department of Macromolecular Science & Engineering at Case Western Reserve University, where he is currently the department Chairman. He has published approximately 200 peer-reviewed papers, holds 20 US patents, launched a startup company, is a Fellow of the American Chemical Society and is on the Advisory Boards of a number of journals and academic departments.

das44@case.edu