

Plasma and 3D Printing in Drug Discovery and Development

Yaseen Elshaier

Pharmaceutical and Organic Chemistry Department, Faculty of Pharmacy, University of Sadat City, Menoufia, Egypt,
E-mail: Yaseen.elshaier@fop.usc.edu.eg.

ABSTRACT: The necessity of sustainable technology to accelerate the drug discovery & development pipeline is urgent. Plasma, the fourth state of matter, can be utilized in green organic synthesis for preparation of active pharmaceutical ingredients (APIs) or for obtaining their starting materials. Based on the type of reactor, the resulting organic material will be generated. Carbon dioxide, the most common polluted gas, is used as a building block in organic synthesis. Plasma can capture CO₂ to generate methanol. The future work is to synthesize aspirin for its starting material through plasma. Another green chemistry technique is 3D printing. 3D printing is an additive process, where multiple layers from CAD (computer-aided design) drawings are laid down one after another to create different shapes. 3D printing is used to build reproducible catalysis to perform certain reactions as multicomponent or Mannich reactions. nifedipine, fluoxetine, atropine, or ethacrynic acid could be prepared by such technology.