abstract
Additive manufacturing, also known as 3-dimensional (3-d) printing, is now a rapidly growing manufacturing technique. Innovative and complex designs in various aspects of engineering have called for more efficient manufacturing techniques and 3-d printing has been a perfect choice in that direction. This research investigates the use of additive manufacturing in fabricating polymer heat exchangers and estimate their effectiveness as a heat transfer device. Fused Deposition Modeling (FDM), Selective Laser Sintering (SLS) and Stereolithography (SLA) are the three 3-d printing techniques that are explored for their feasibility in manufacturing heat exchangers. The research also explores a triply periodic minimal structure-the gyroid as a heat exchanger design. From the results obtained it can be inferred that using polymers in heat exchangers helps reducing corrosion and fouling problems, but it affects the effectiveness of the heat exchangers. For our design, the maximum effectiveness achieved was 0.08.