SEM Observation

The CFC trimmings and off-cuts were mechanically refined through two methods: hammer milling with a 25.4mm screen and shredding with 19mm wide teeth. The hammer-milled material was then sieved to different fractions as retained in 19.05mm (19.05), passed to 19.05mm and retained 12.7mm (12.7) passed 12.7mm and retained 4.7mm (4.7), and passed 4.7mm (<4.7), respectively. The materials processed by the shredder were screened with a 12.7mm screen and utilized as-is for the recycled composite process [1]. The SEM configurations of untreated and heat-treated recycled carbon fiber composites (rCFCs) are given in Figure 1. rCFCs were heat-treated at 360 °C for 10min [2-4] based on the thermal properties of rCFCs [5-8]. SEM configuration of CFCs shows different kinds of defects in the structure of recycled CFCs including broken fibers, fiber pull-out, fiber-matrix separation. These defects maybe caused reaching of CFC to the end of life or can be created during recycling process [9-10]. Comparing SEM of untreated and heat treated rCFC indicates that there is no significant difference between their micrographs.

Figure 1: SEM configurations of rCFC under different conditions: (a) untreated Epoxy/CFC (b) heat-treated Epoxy/CFC (c) untreated VE/CFC (d) heat-treated VE/CFC.
References


