

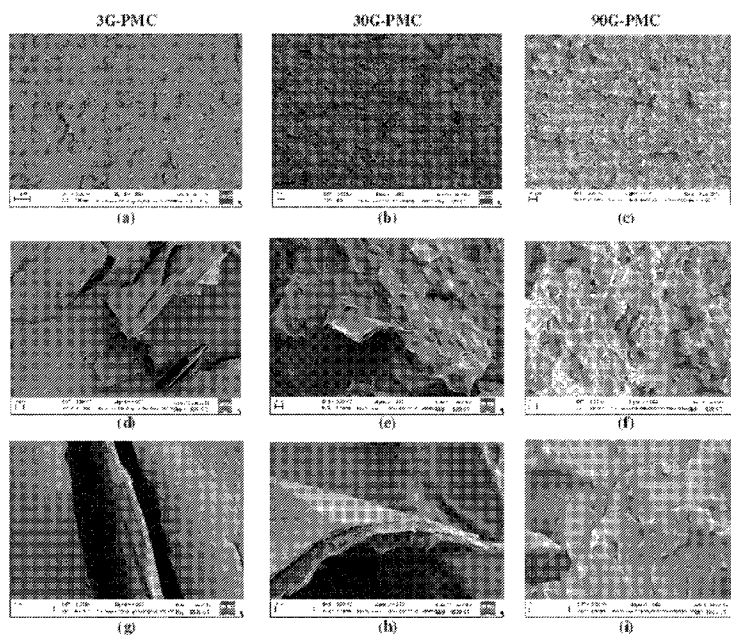


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[Continued on next page]

- (54) Title: *IN SITU* EXFOLIATION METHOD TO FABRICATE A GRAPHENE-REINFORCED POLYMER MATRIX COM-
POSITE

FIG. 1



(57) Abstract: A method for forming a graphene-reinforced-polymer matrix composite by distribut-
ing graphite microparticles into a molten thermo-
plastic polymer phase comprising one or more mol-
ten thermoplastic polymers; and applying a succes-
sion of shear strain events to the molten polymer
phase so that the molten polymer phase exfoliates
the graphene successively with each event, until
tearing of exfoliated multilayer graphene sheets oc-
curs and produces reactive edges on the multilayer
sheets that react with and cross-link the one or
more thermoplastic polymers; where the one or
more thermoplastic polymers are selected from
thermoplastic polymers subject to UV degradation.



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