Electronic Supplementary Material (ESI) for Nanoscale Advances.

Supporting Information

Radio Frequency Heating and Material Processing Using Carbon Susceptors

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Table S1: Reported heating response of carbonaceous materials on exposure to RF fields and its applications.

RF Susceptor	Embedding Medium	Input power (W)/ Frequency (MHz)	Max reported dT/dt (°C/s) or Max T (°C) @ SS	Application [Reference]
MWCNT (0.1-10wt%)	Polylactic acid	10 W /1-200 MHz (Fringing Field)	16 °C/s	Bonding [1]
s-SWCNT	DOC	1 W/60–70 MHz	25.6 °C/s	Film purity [2]
m-SWCNT	DOC		10.4 °C/s	
m-SWCNT	SDS		1.51 °C/s	
MWCNT (3 wt%)	Polycarbosilane	100 W/76–78 MHz	600 °C (SS)	Ceramic Precursor curing [3]
MWCNT (0.1 wt%)	Polycaprolactone	50 W/110 MHz	2 °C/s	Heating Fibers [4]
LIG	None	10 W/100-120 MHz	21–122 °C/s	Welding Polymers [5]
SiC fiber	N/A	30 W/100 MHz	400 °C (SS)	Catalytic Reactor [6]
GO	None	5 W/107-108 MHz	10.9 °C/s	GO reduction [7]
GO (15 wt%)	Polyvinyl Alcohol		1.5 °C/s	
Carbon Tape	None	25 W/101 MHz	208 °C (SS)	Thermal actuator [8]
LIG		63 W/101 MHz	202 °C (SS)	
Carbon Fibers	Epoxy	25 W/ 66 MHz	70 °C/s	Curing CF composites [9]
CB	Structural Adhesive	10 W/ 138 MHz	1 °C/s	Adhesive bonding of metals [10]
CB	Structural Adhesive	100 W/114 MHz	~3.5 °C/s	Adhesive bonding of plastics [11]
Graphene	None	5 W/ 70–130 MHz	Up to 25 °C/s	Identify type of graphene [12]
PAN films	None	30 W/ 106 MHz	280 °C (SS)	Crosslinking [13]

SS: Steady state; dT/dt: (change in Temperature)/(change in time); MWCNTs: Multi-wall carbon nanotubes; m- or s-SWCNTs: metallic or semiconducting Single-wall carbon nanotubes; GO: Graphene oxide; LIG: Laser induced graphene; SiC: Silicon carbide; CB: Carbon black; SDC: Sodium dodecyl sulfate; DOC: Sodium deoxycholate

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