

Supporting Information

Table S1 Information obtained from the image analysis

Sample	CB/NR	CNT-CB/NR	GO-CB/NR
Number of detected carbon black particles	137	205	232
Total area /nm ²	42073	42276	50841
Average area of particles /nm ²	307	206	197
Area fraction /%	3.4	3.6	4.3

Table S2 The constant parameters for CB/NR, CNT-CB/NR and GO-CB/NR composites in exponential equation 4

Sample	CB/NR	CNT-CB/NR	GO-CB/NR
<i>A</i>	0.079	0.054	0.016
<i>B</i>	0.079	0.054	0.016
<i>C</i>	0.079	0.054	0.016
<i>E</i>	8.01	8.28	8.3
<i>t</i> ₁	-358.74	-344.07	-281.56
<i>t</i> ₂	-398.6	-382.31	-312.83
<i>t</i> ₃	-438.46	-420.54	-344.11

Table S3 Experimental and fitted crack propagation rates (nm/cycle) of CB/NR, CNT-CB/NR and GO-CB/NR composites

Sample	CB/NR	CNT-CB/NR	GO-CB/NR
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	experimental data	fitting data	experimental data	fitting data	experimental data	fitting data
500	8.85	8.82	8.87	8.88	8.53	8.51
800	9.74	9.81	9.65	9.62	8.93	8.97
1100	13.11	12.14	10.55	11.27	9.87	9.97
1400	17.81	16.55	13.62	14.98	12.23	12.81
1900	36.04	39.27	31.40	34.27	28.53	32.17

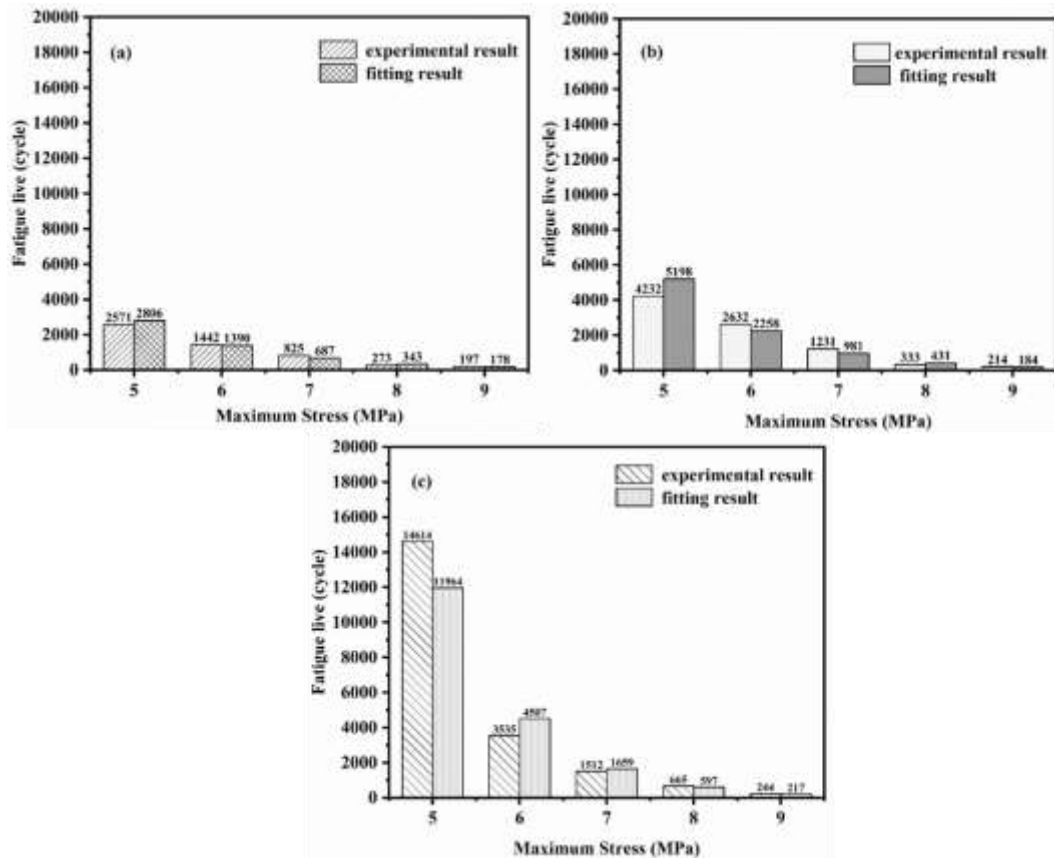


Fig. S1. Fatigue lives - Experimental results and fitting results of (a) CB / NR (b) CNT-CB / NR and (c) GO-CB / NR composites under different maximum stress

