

List of Symbols

No.	Symbol	Explanation	Unit
1.	β	Full width at half maximum	Degree
2.	γ	Gamma irradiation	kGy
3.	γ_L	Surface tension of liquid	mN/m
4.	γ_l^d	Dispersive component of surface energy of liquid surface	mJ/m ²
5.	γ_l^p	Polar component of surface energy of liquid surface	mJ/m ²
6.	γ_s^d	Dispersive component of surface energy of solid surface	mJ/m ²
7.	γ_s^p	Polar component of surface energy of solid surface	mJ/m ²
8.	$\dot{\gamma}_{app}$	Apparent shear rate	s ⁻¹
9.	ε'	Dielectric constant in the neighborhood of the percolation threshold	-
10.	ε''	Loss factor	-
11.	ε'_i	Dielectric constant of insulating matrix	-
12.	η	Viscosity	Pa.s
13.	η_{app}	Apparent shear viscosity	Pa.s
14.	θ	Angle of incident X-ray	Degree
15.	θ_l	Contact angle of the liquid	Degree
16.	λ	Wavelength of X-ray	cm
17.	ρ	Density of the filler	g/cm ³
18.	ρ'	AC Resistivity	Ohm.cm
19.	ρ_r	Density of rubber	g/cc
20.	ρ_s	Density of swelling solvent	g/cc
21.	σ_{AC}	AC Conductivity	S/cm
22.	σ_{DC}	DC Conductivity	S/cm
23.	σ_c	Tensile strength of the composite	MPa
24.	σ_m	Tensile strength of the virgin matrix	MPa
25.	τ	Equilibrium time	s
26.	τ_{app}	Apparent shear stress	Pa
27.	ϕ	Volume fraction of filler	-

No.	Symbol	Explanation	Unit
28.	φ	Initial weight of the sample	g
29.	ψ	Volume fraction of conductive particles	-
30.	ψ_c	Percolation threshold	-
31.	ω	Weight of the penetrating liquid	g
32.	A	Area of sample	cm ²
33.	C	Capacitance	pF
34.	C_s	Crystallite size	nm
35.	D	Deswollen weight of rubber	g
36.	d	Interplanar distance	nm
37.	d'_c	Diameter of the capillary	cm
38.	E'	Storage modulus	Pa
39.	f	Frequency	Hz
40.	K	Thermal conductivity	W/mK
41.	l'_c	Length of the capillary	cm
42.	Q	Volumetric flow rate	m ³ /s
43.	q	Critical exponent	-
44.	R	Peak intensity ratio	-
45.	R_a	Arithmetic mean roughness	nm
46.	R_f	Reinforcing factor	-
47.	R_{eff}	Effective radius of packed column	cm
48.	R_q	Root mean square roughness	nm
49.	S	Surface area of powder in the packed column	cm ²
50.	t	Thickness of sample	mm
51.	$\tan \delta$	Damping factor	-
52.	V_r	Volume fraction of rubber	-
53.	V_{rf}	Volume fraction of rubber in filled vulcanizate	-
54.	V_{r0}	Volume fraction of rubber in unfilled vulcanizate	-
55.	W	Power	W
56.	W_p	Weight of powder in tapped in column	g
57.	z_i	Height variation	nm