Effect of GO nanosheets on microstructure, mechanical and fracture properties of cement composites

Submitted to Construction and building materials

June, 2022

Version R1, September 2022

~~**EFFECT OF GO NANOSHEETS ON FRACTURE TOUGHNESS OF CEMENT COMPOSITES**~~

EFFECT OF GO NANOSHEETS ON MICROSTRUCTURE, MECHANICAL AND FRACTURE PROPERTIES OF CEMENT COMPOSITES

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FIGURES AND TABLES

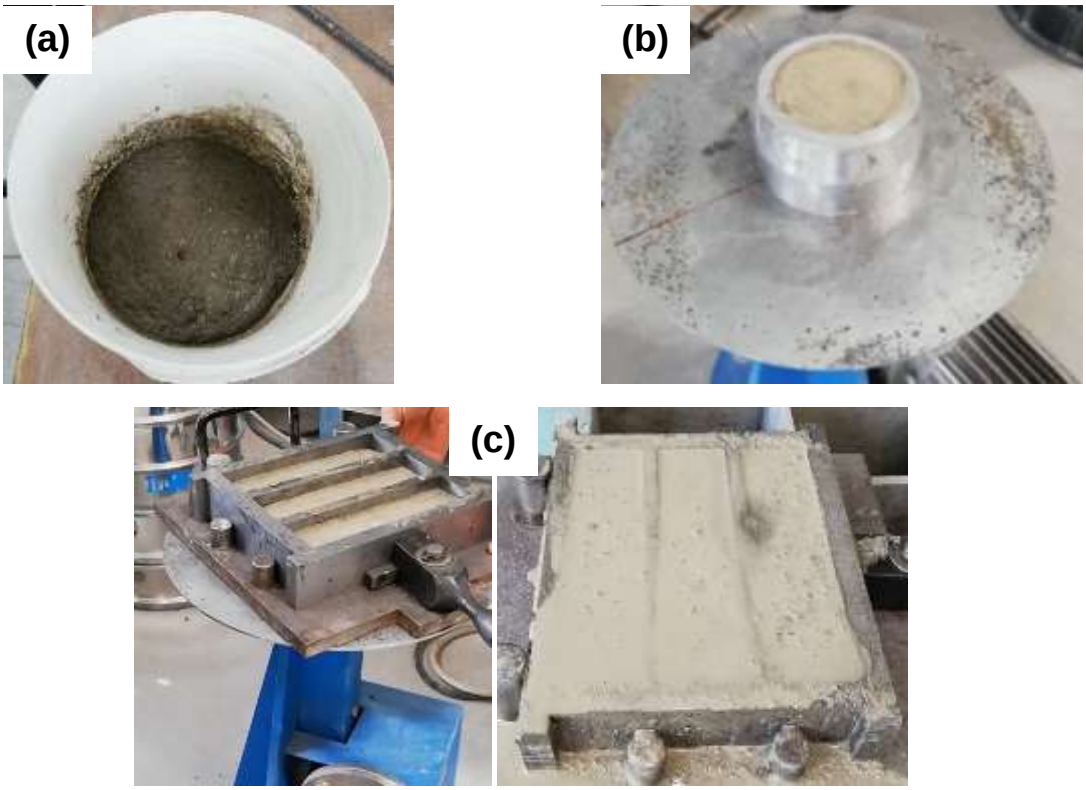

Figure 1. Preparation of GO-B specimens: (a) fresh slurry, (b) flow table test, (c) fresh slurry compacted in prismatic moulds.

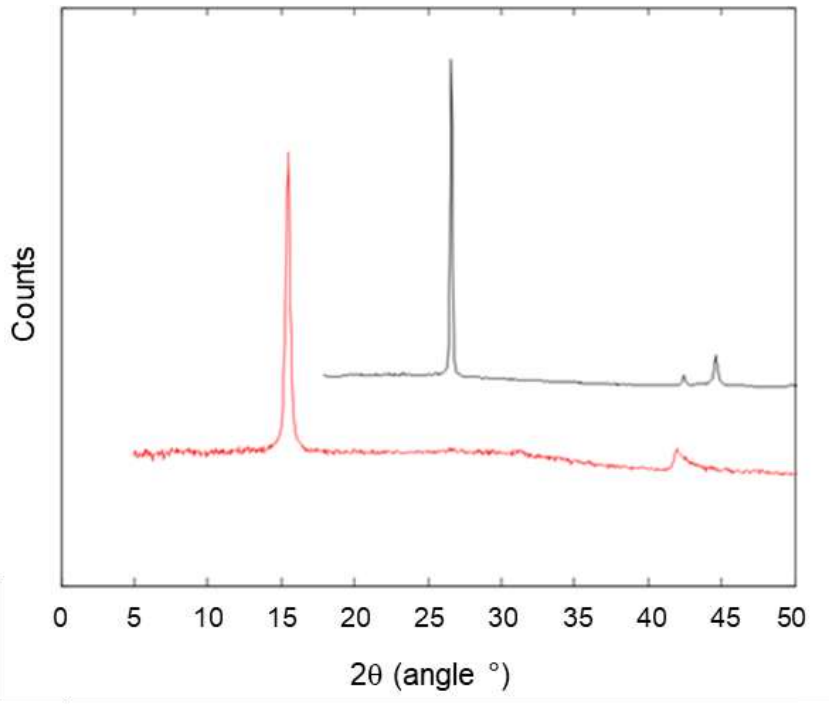

Figure 2. XRD spectra of pure graphite (black line) and GO (red line).

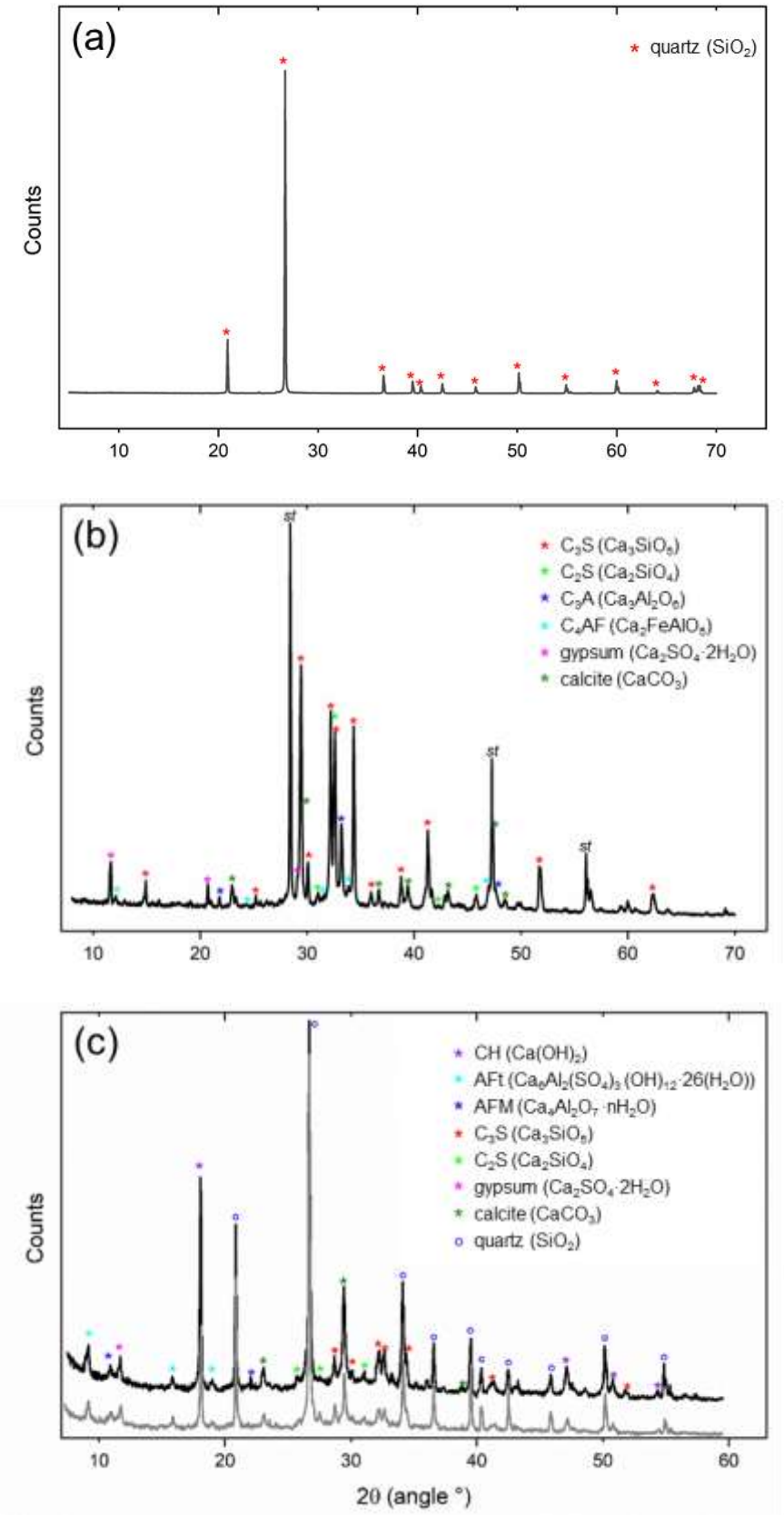

Figure 3. X-ray diffraction patterns of: (a) aggregates, (b) cement, (c) PM (black line) and GO-B specimens (grey line).

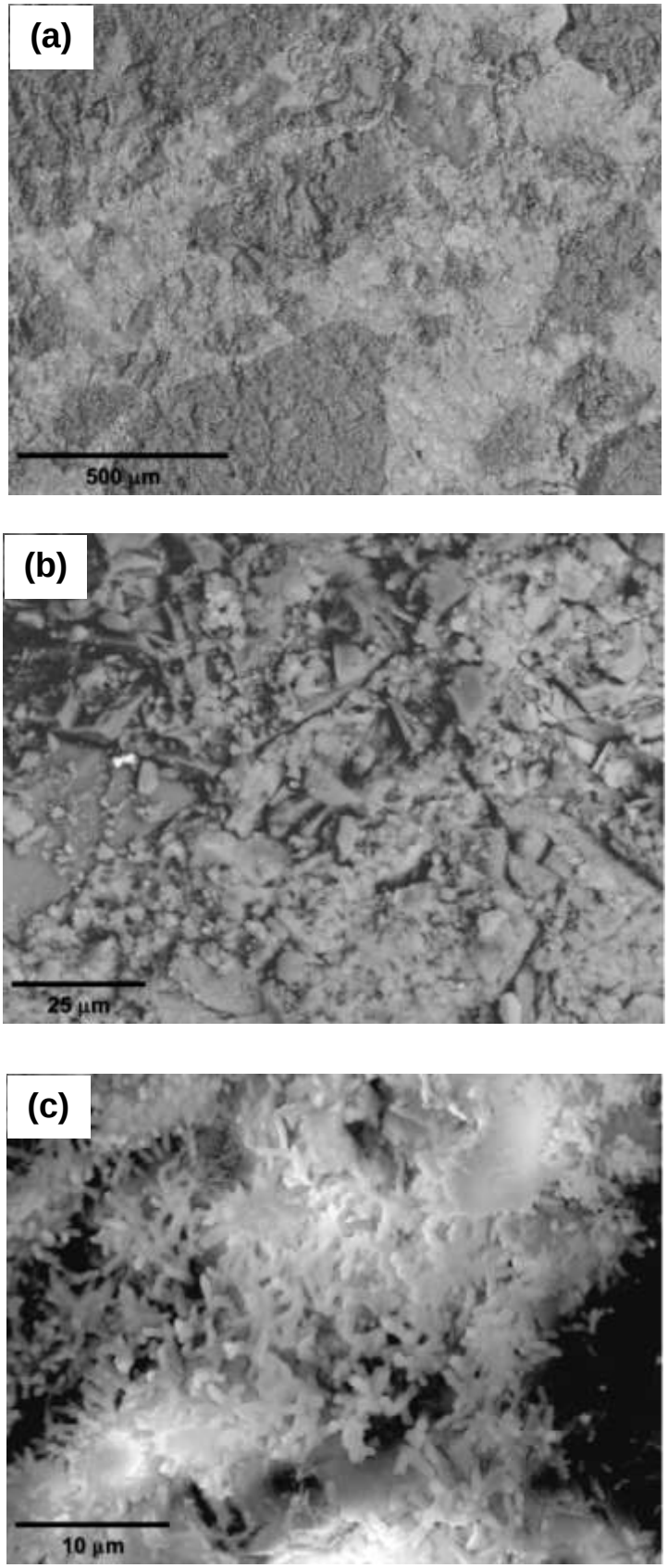

Figure 4. SEM images (in BSE) of PM specimen at different levels of magnification: (a) 55X, (b) 800X and (c) 1000X.

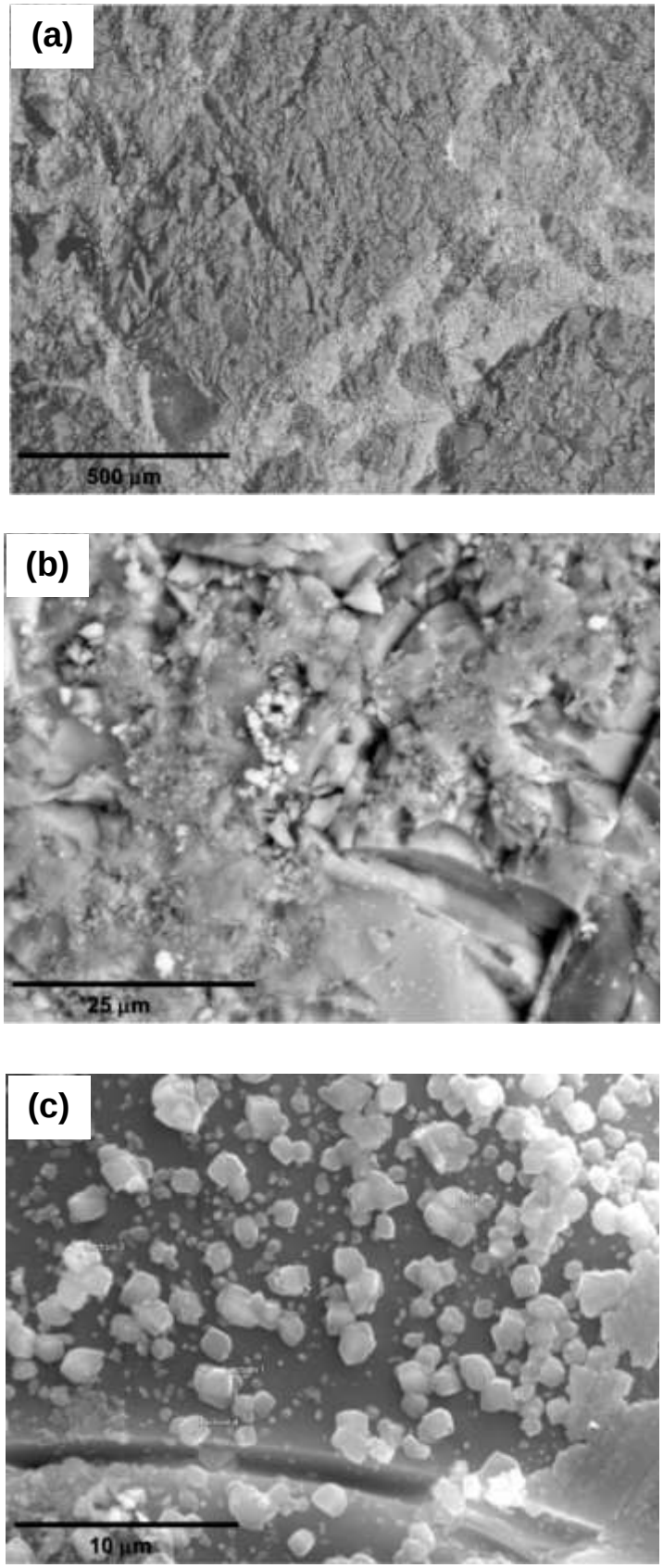

Figure 5. SEM images (in BSE) of GO-B specimen at different levels of magnification: (a) 55X, (b) 800X and (c) 1000X.

Table 1. Flexural and compression test results for both PM and GO-B specimen type.

SPECIMEN TYPE	P_f [kN]		R_f [MPa]		P_c [kN]		R_c [MPa]	
	μ	σ	μ	σ	μ	σ	μ	σ
PM	1.994	0.103	5.285	0.297	151.027	6.660	87.517	2.980
GO-B	1.993	0.108	5.516	0.213	155.915	7.410	90.567	3.496

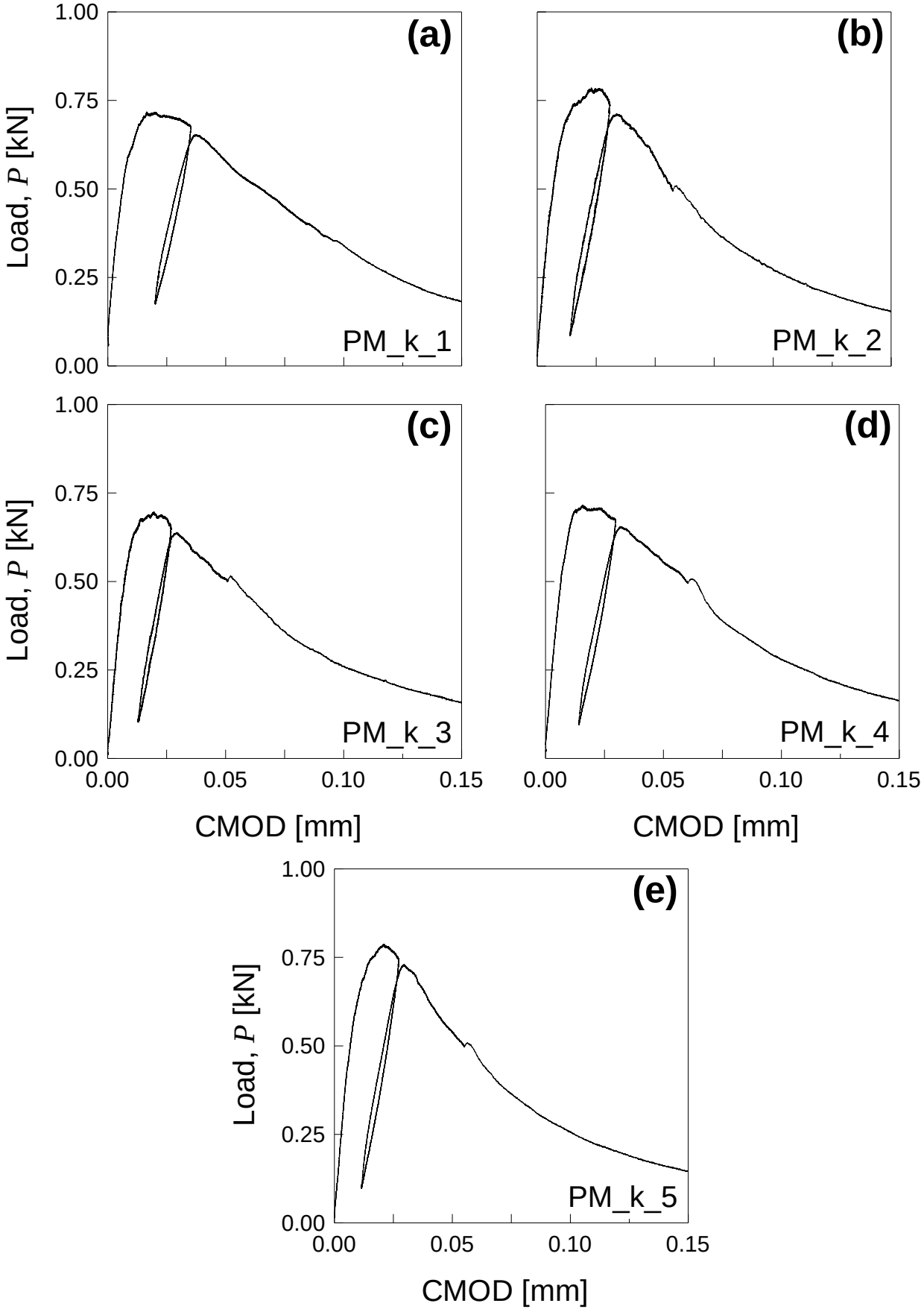

Figure 6. Load – Crack Mouth Opening Displacement (CMOD) curves for PM_k specimens.

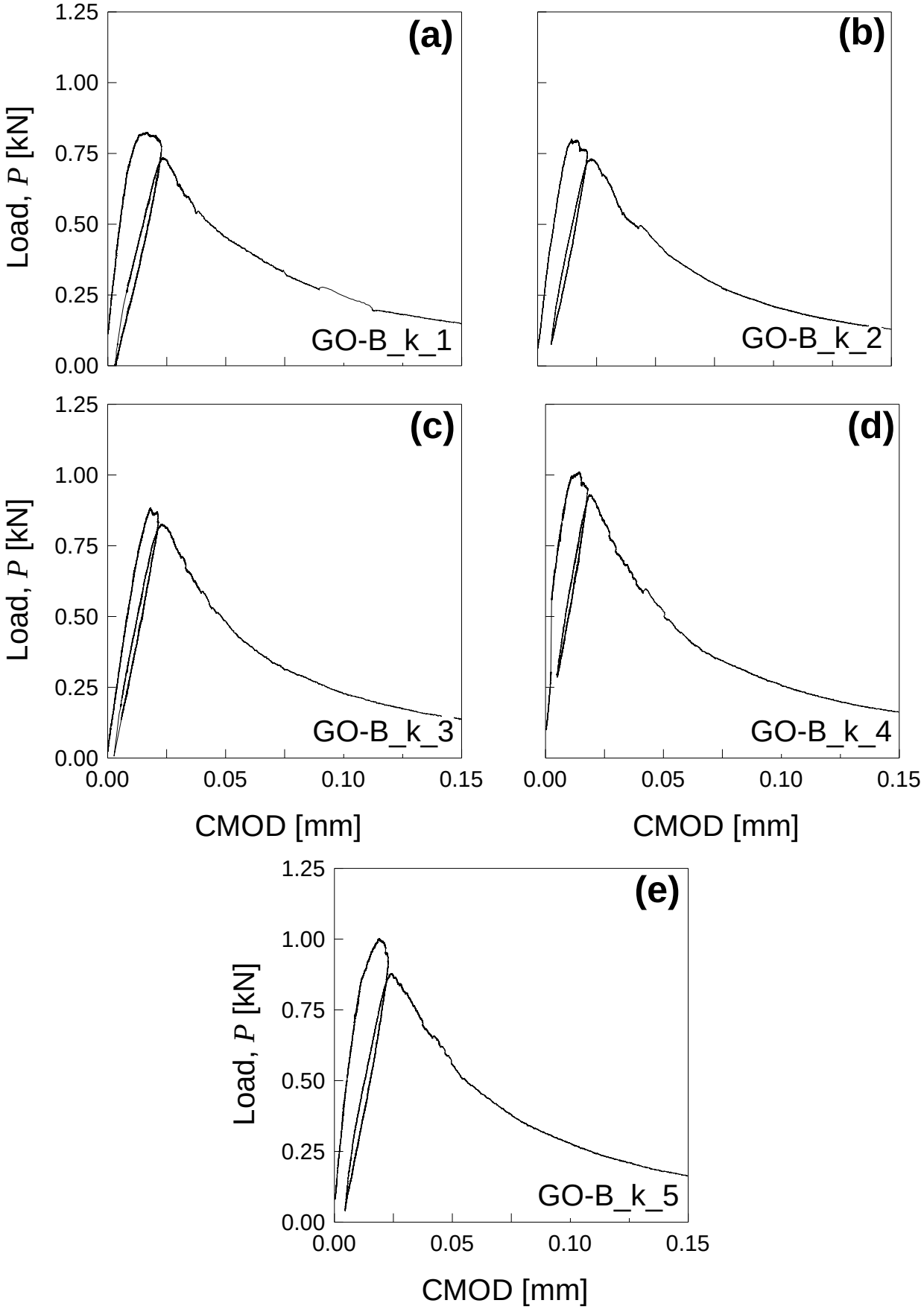

Figure 7. Load – Crack Mouth Opening Displacement (CMOD) curves for GO-B_k specimens.

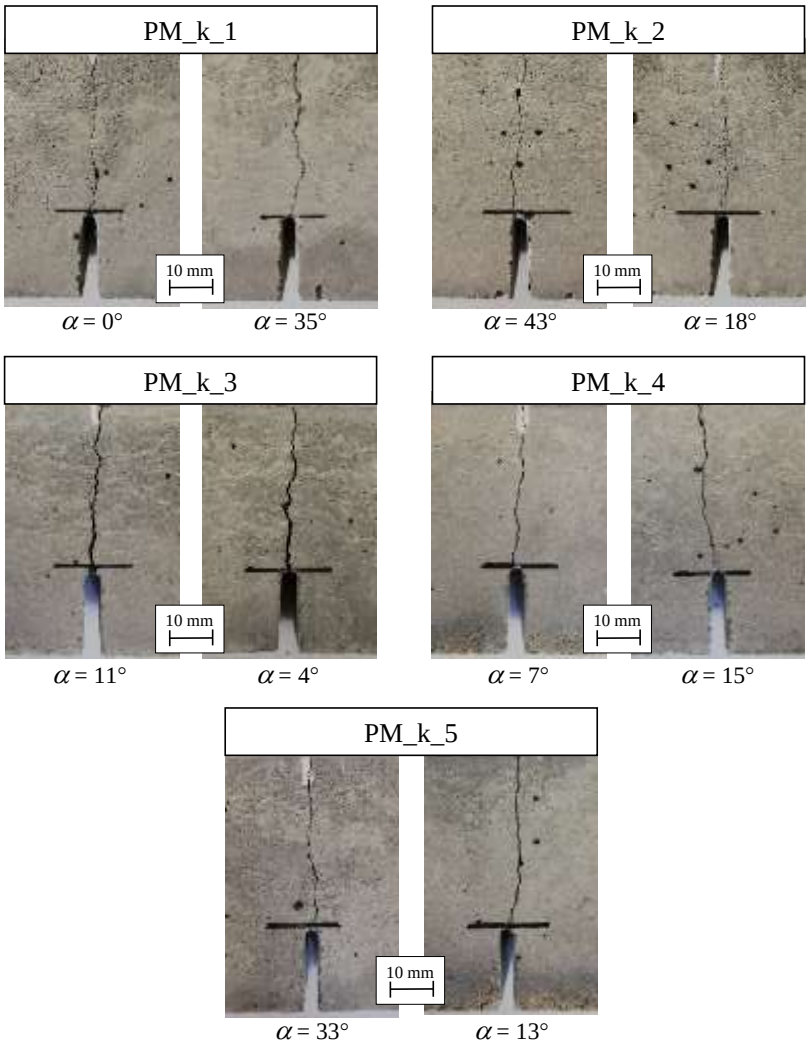

Figure 8. Crack paths and kinking angle values for PM_k specimens.

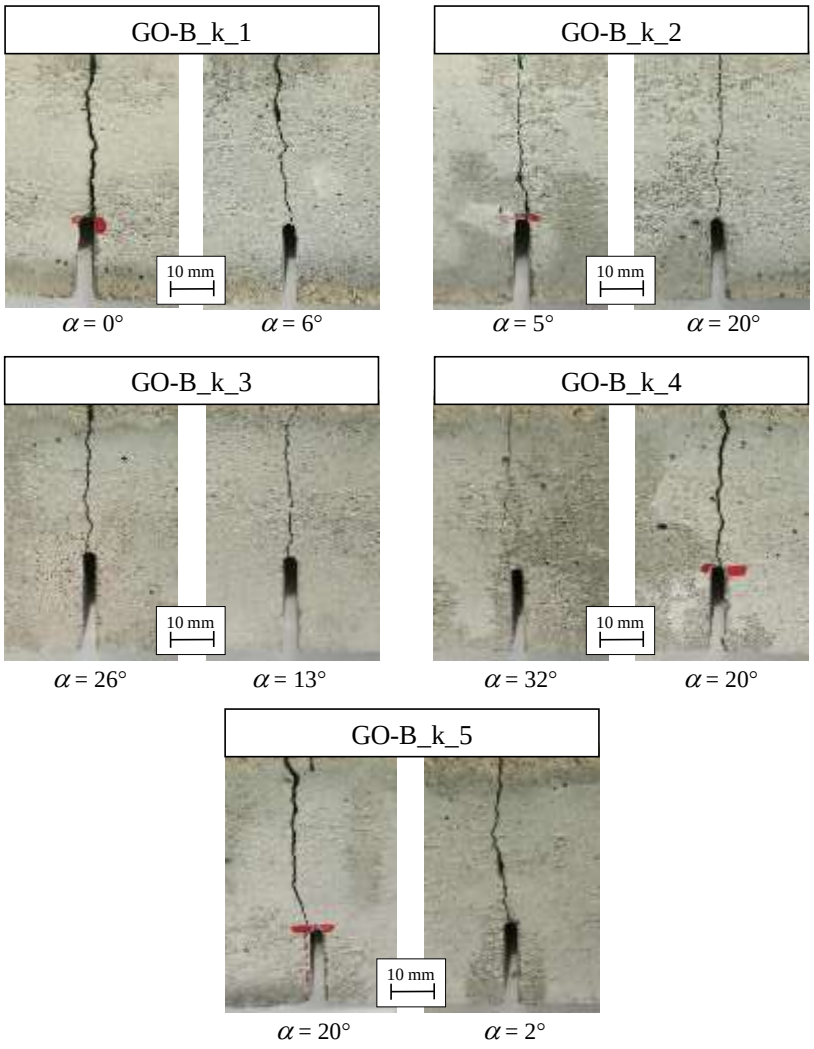

Figure 9. Crack paths and kinking angle values for GO-B_k specimens.

Table 2. Fracture test results for both PM and GO-B specimen type.

SPECIMEN TYPE	P_{max} [kN]		α [°]		E [GPa]		$K^{S}_{(I+II)C}$ [MPa·m$^{0.5}$]	
	μ	σ	μ	σ	μ	σ	μ	σ
PM	0.741	0.043	17.9	9.229	31.873	1.571	0.788	0.027
GO-B	0.916	0.086	14.4	8.742	33.529	1.529	0.992	0.072