

## Electronic supplementary information (ESI)

### **Evaluation of the dispersion of metakaolin-graphene oxide hybrid in water and cement pore solution: Can metakaolin really improve the dispersion of graphene oxide in the calcium-rich environment of hydrating cement matrix?**

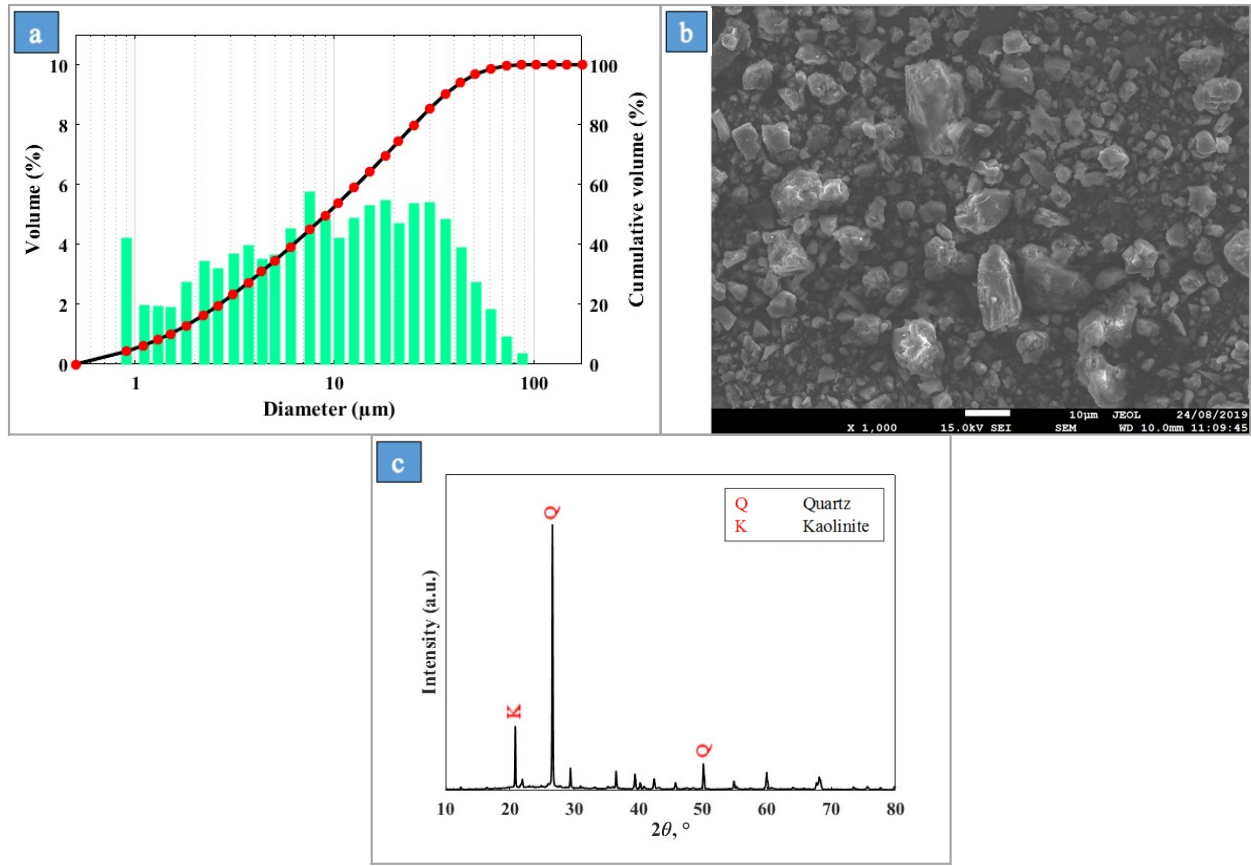
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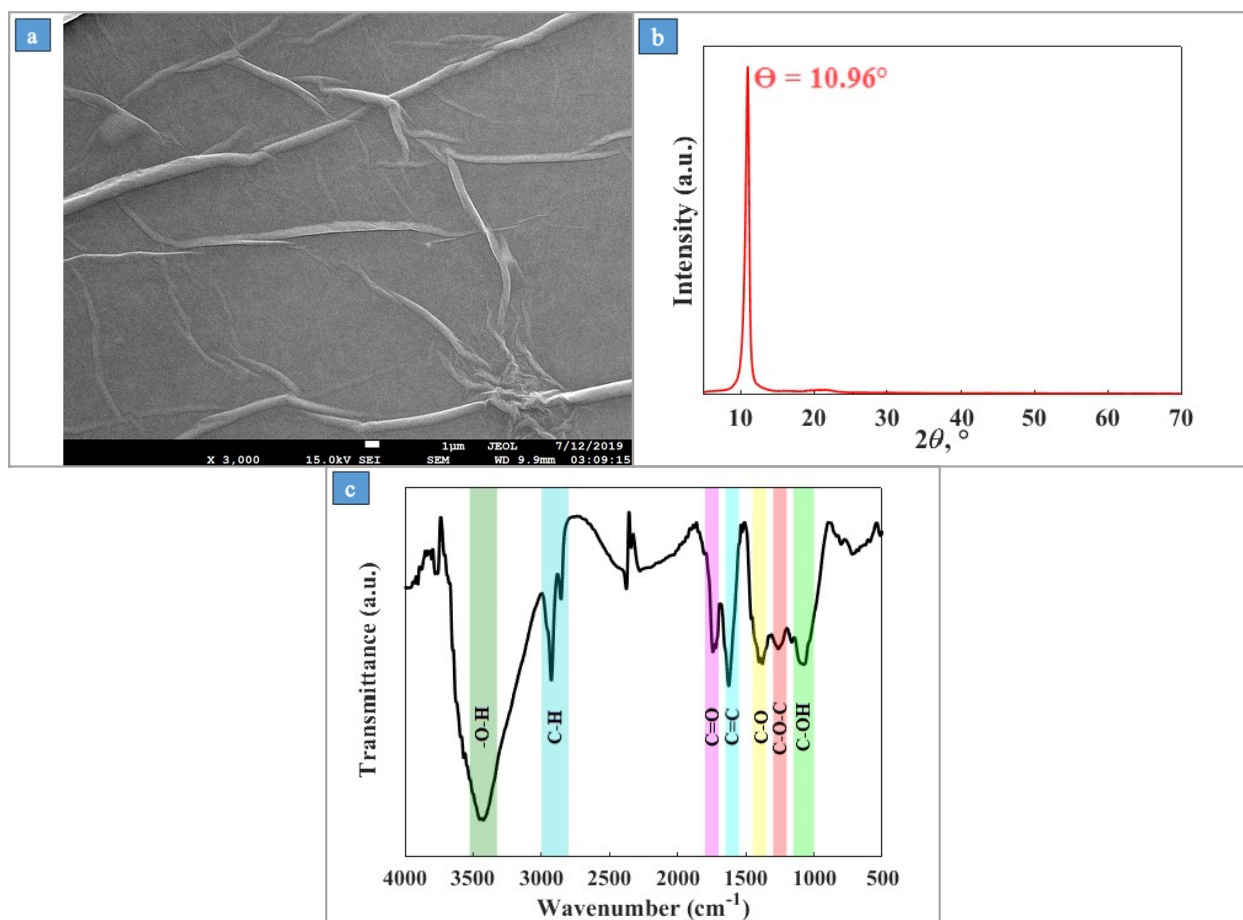
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**Fig. S1.** (a) Particle size distribution (b) SEM image and (c) XRD pattern of metakaolin solid particles.



**Fig. S2.** Characterization of as-received GO (a) SEM micrograph (b) XRD pattern and (c) FTIR spectrum.

**Table S1**

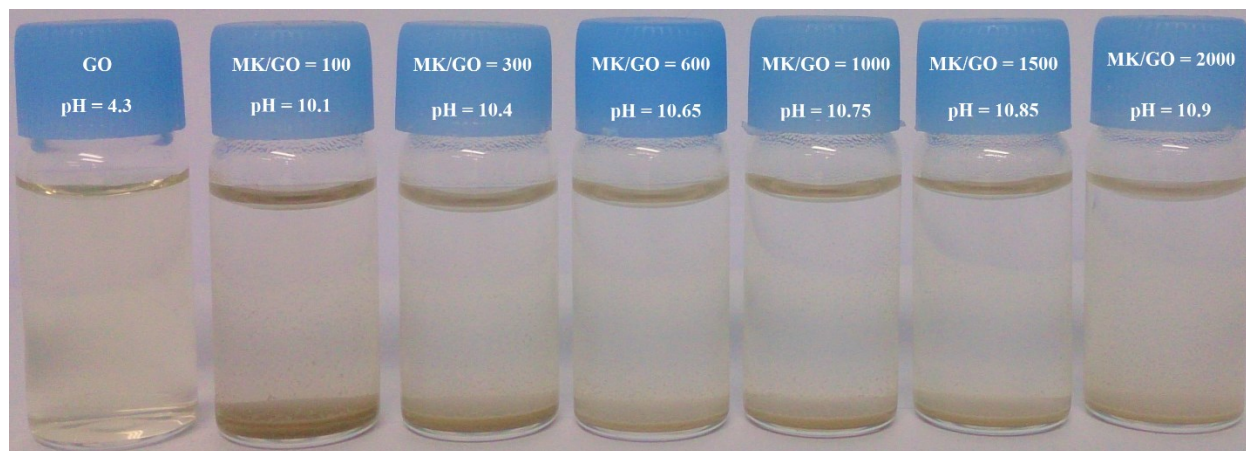
The mix design of the prepared SCPS.

Used chemical (g/l)			
CaSO <sub>4</sub> .2H <sub>2</sub> O	Ca(OH) <sub>2</sub>	KOH	NaOH
27.55	Saturated	22.44	8.00

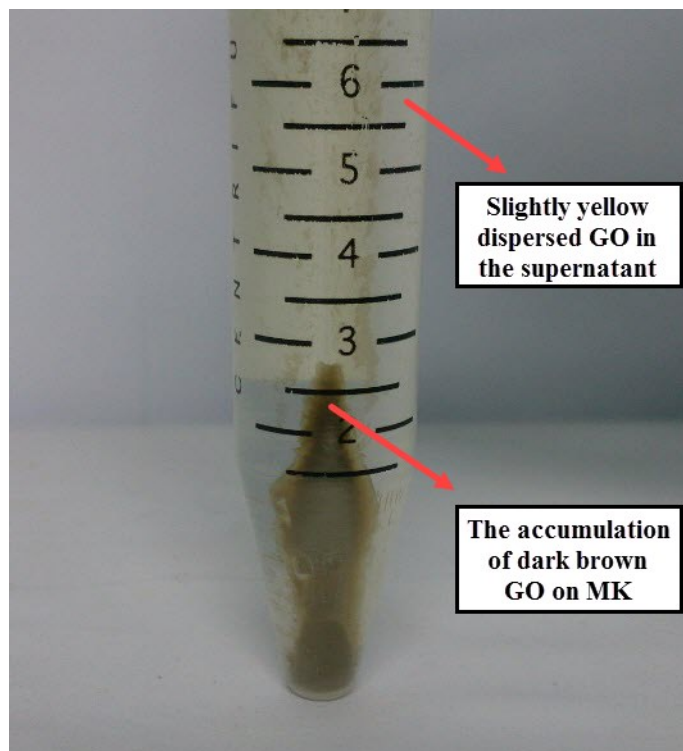
**Table S2**

The result of ICP-OES analysis of SCPS.

Elemental concentration (ppm)				
K	Na	Ca	Si	Fe
7518.8	3943.4	780.05	1.6	0.01



**Fig. S3.** Visual investigation of GO and MK-GO suspensions in water.



**Fig. S4.** Two-phase system of MK-GO suspension due to the centrifuging treatment, prior to the UV-vis characterization.

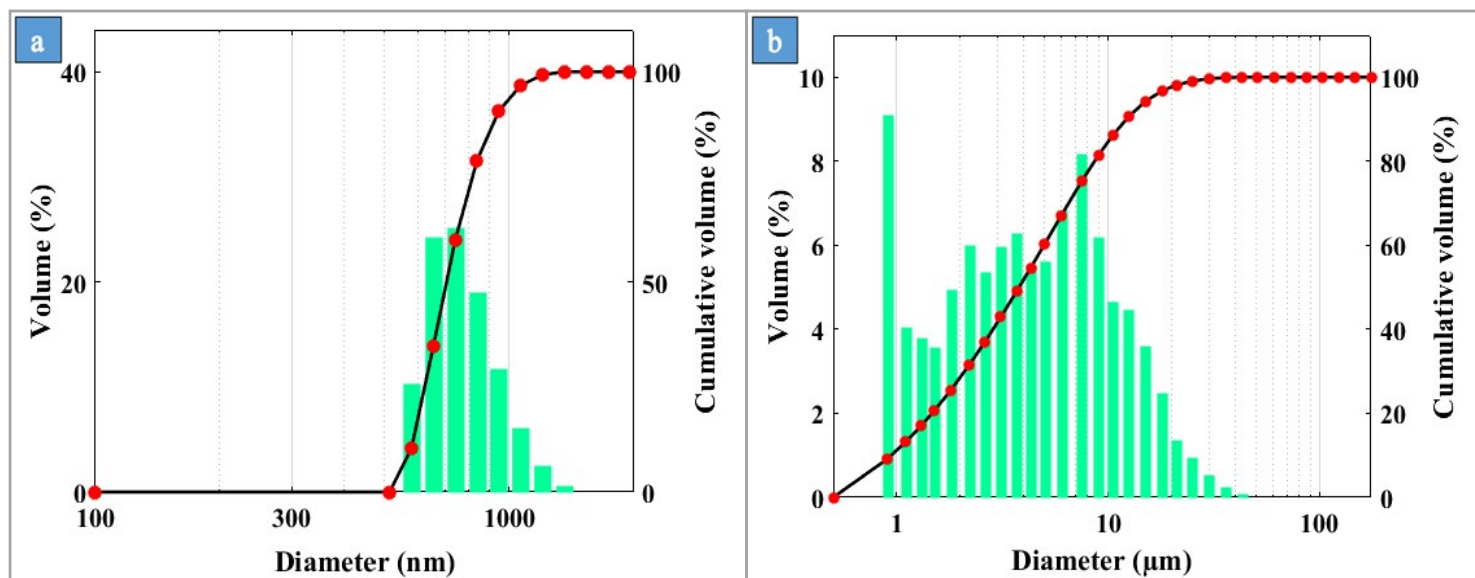


Fig. S5. Particle size distribution of (a) GO suspension and (b) MK suspension in water.

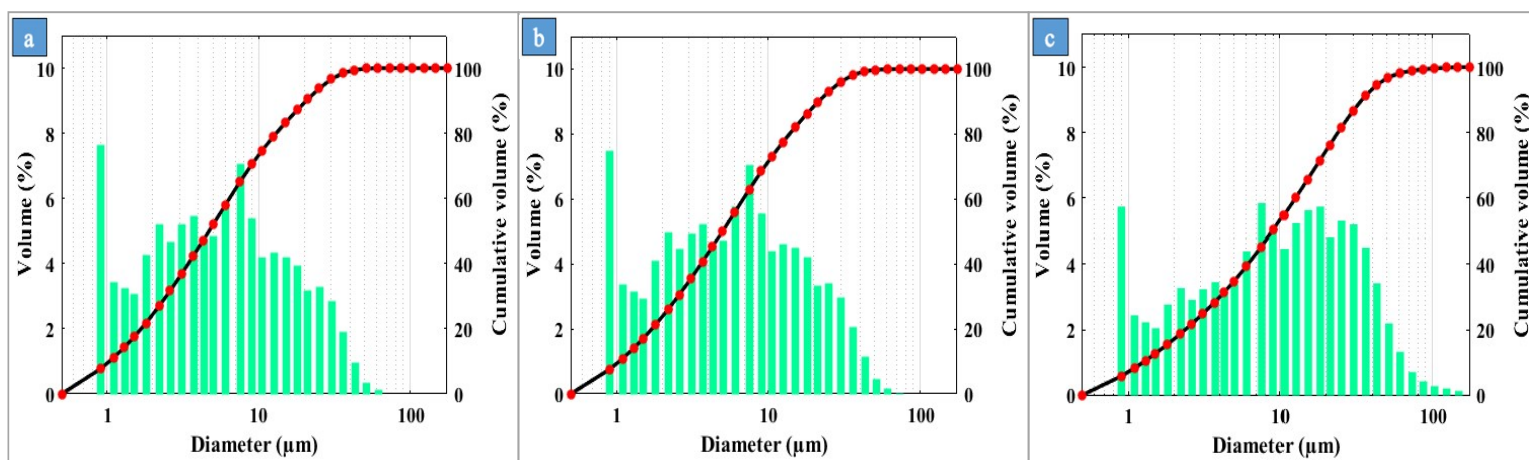


Fig. S6. Particle size distribution of MK-GO suspensions with different MK/GO weight ratios (a) MK/GO = 100 (b) MK/GO = 600 and (c) MK/GO = 1500 in water.

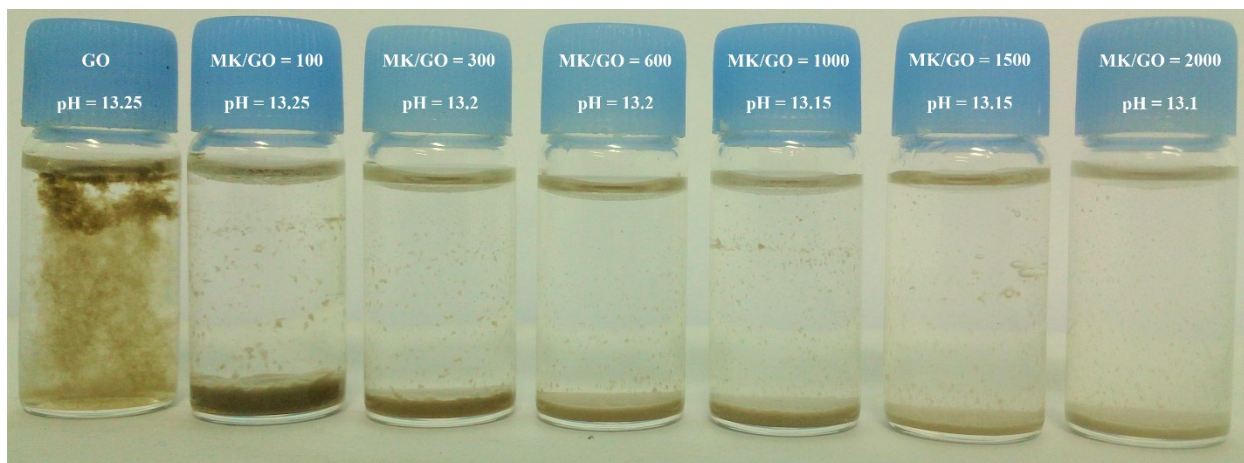


Fig. S7. Visual investigation of GO and MK-GO suspensions in SCPS.

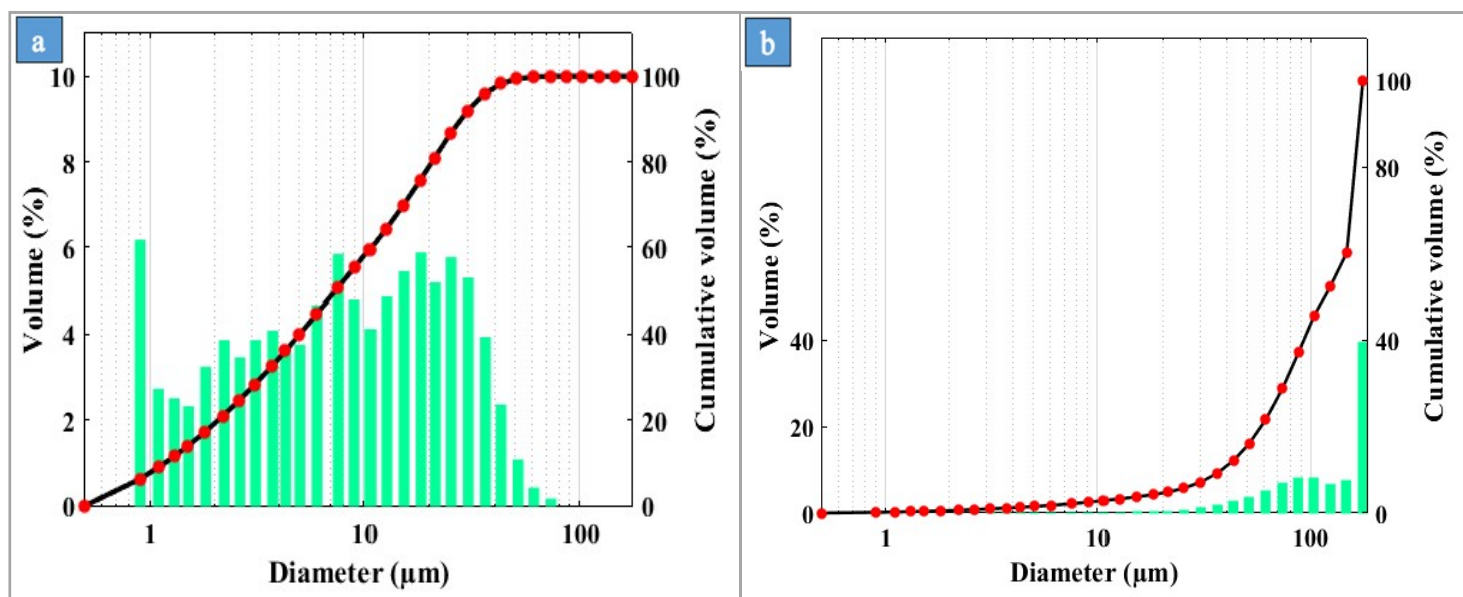
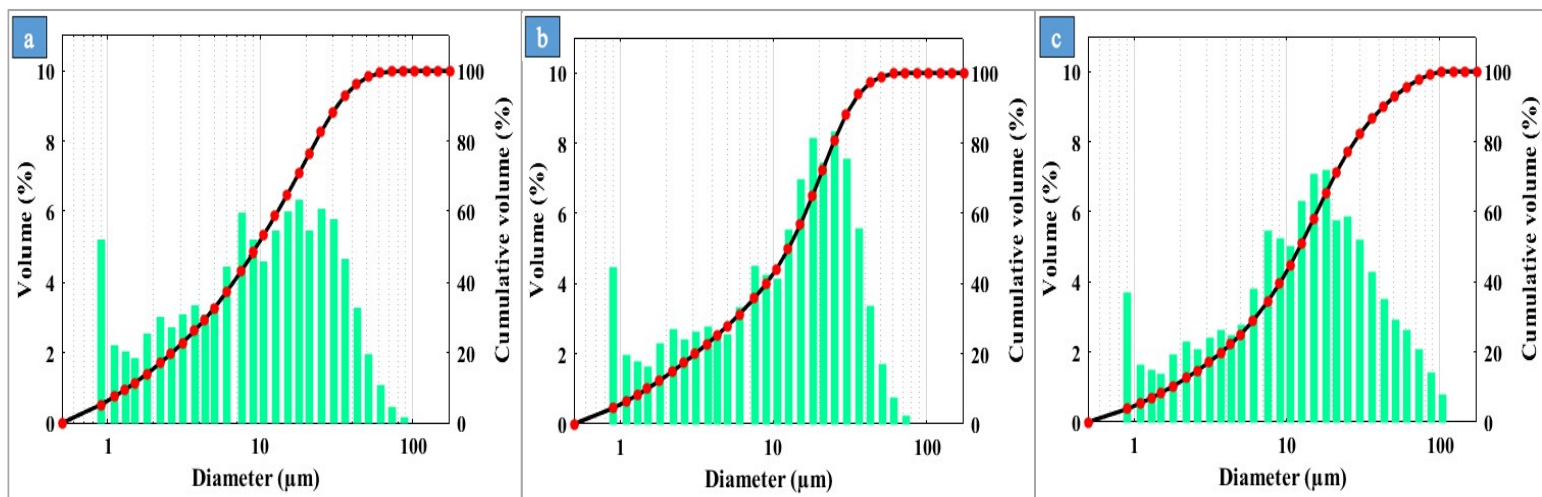


Fig. S8. Particle size distribution of (a) MK suspension and (b) GO suspension in SCPS.



**Fig. S9.** Particle size distribution of MK-GO suspensions with different MK/GO weight ratios (a) MK/GO = 100 (b) MK/GO = 600 and (c) MK/GO = 1500 in SCPS.