

## Effects of surface-modified silica nanoparticles attached graphene oxide using isocyanate-terminated flexible polymer chains on the mechanical properties of epoxy composites

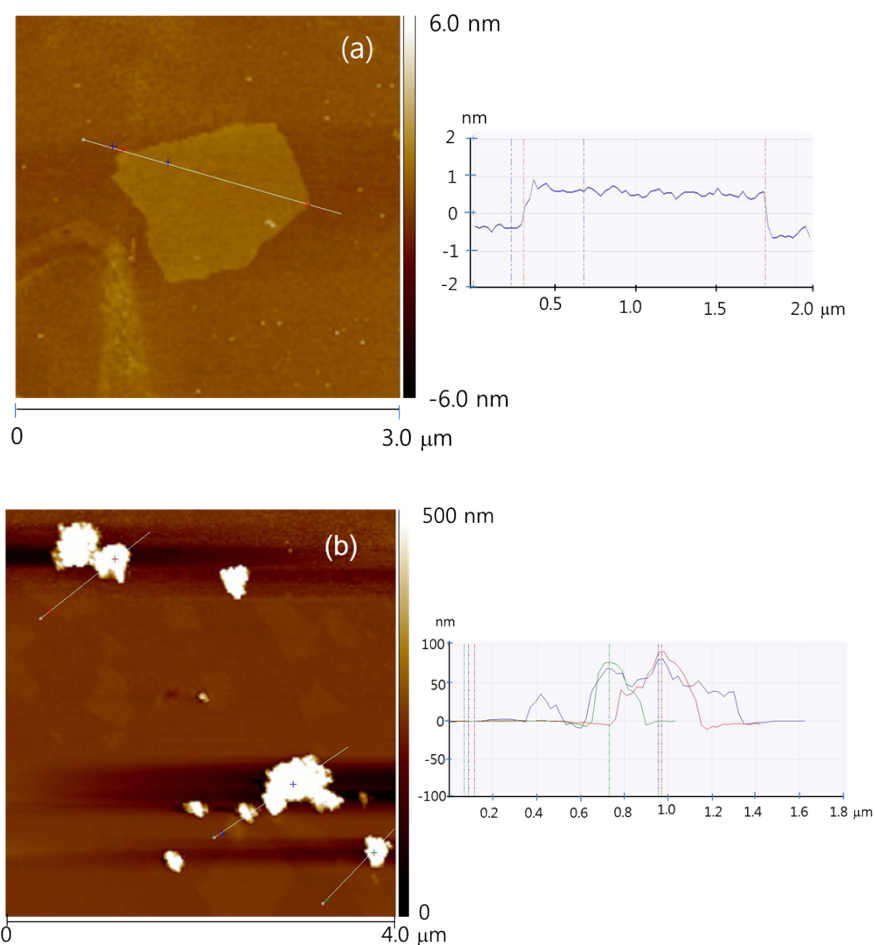
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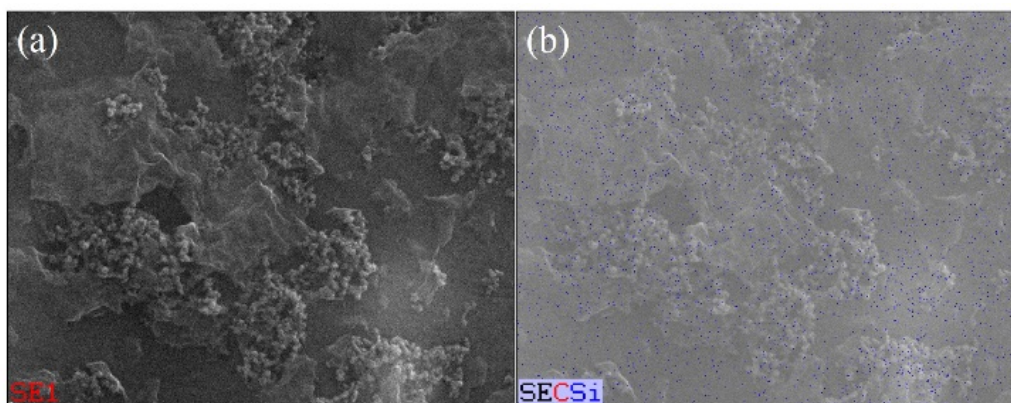
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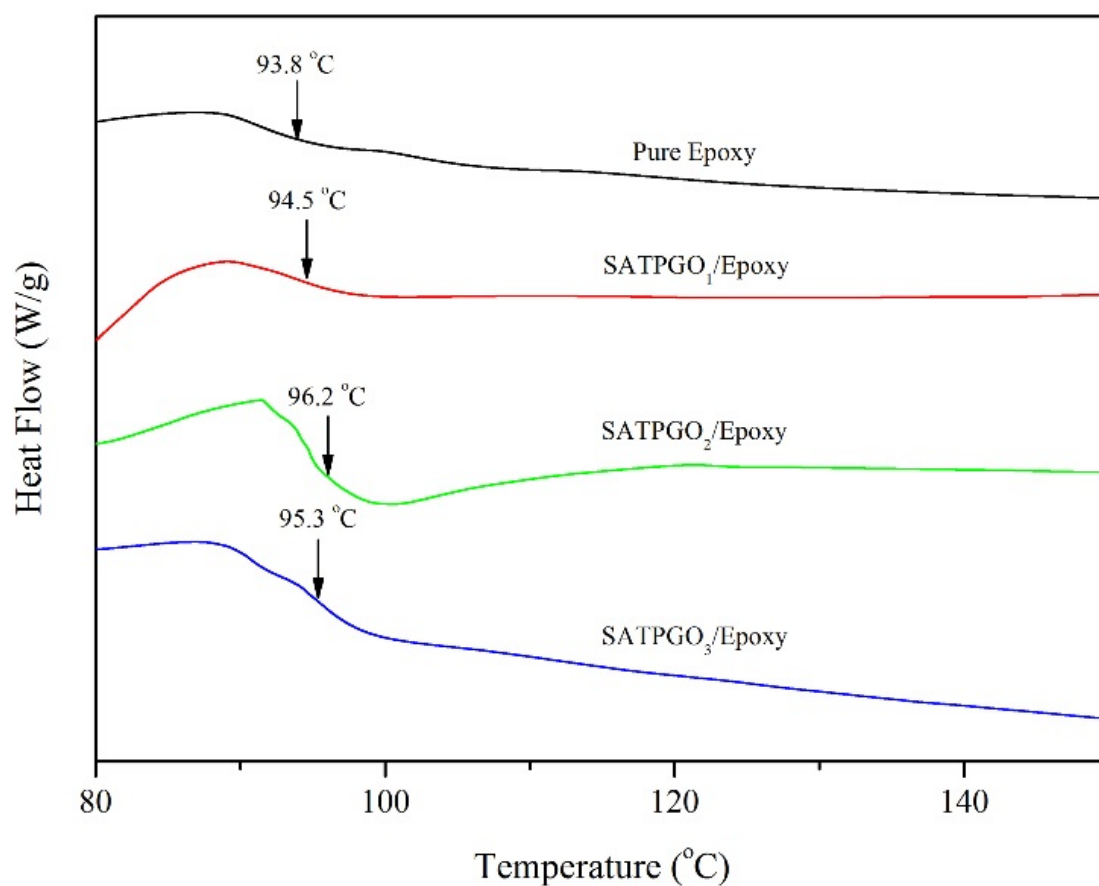
\* Correspondence to: [jhl@jbnu.ac.kr](mailto:jhl@jbnu.ac.kr) (J. H. Lee),



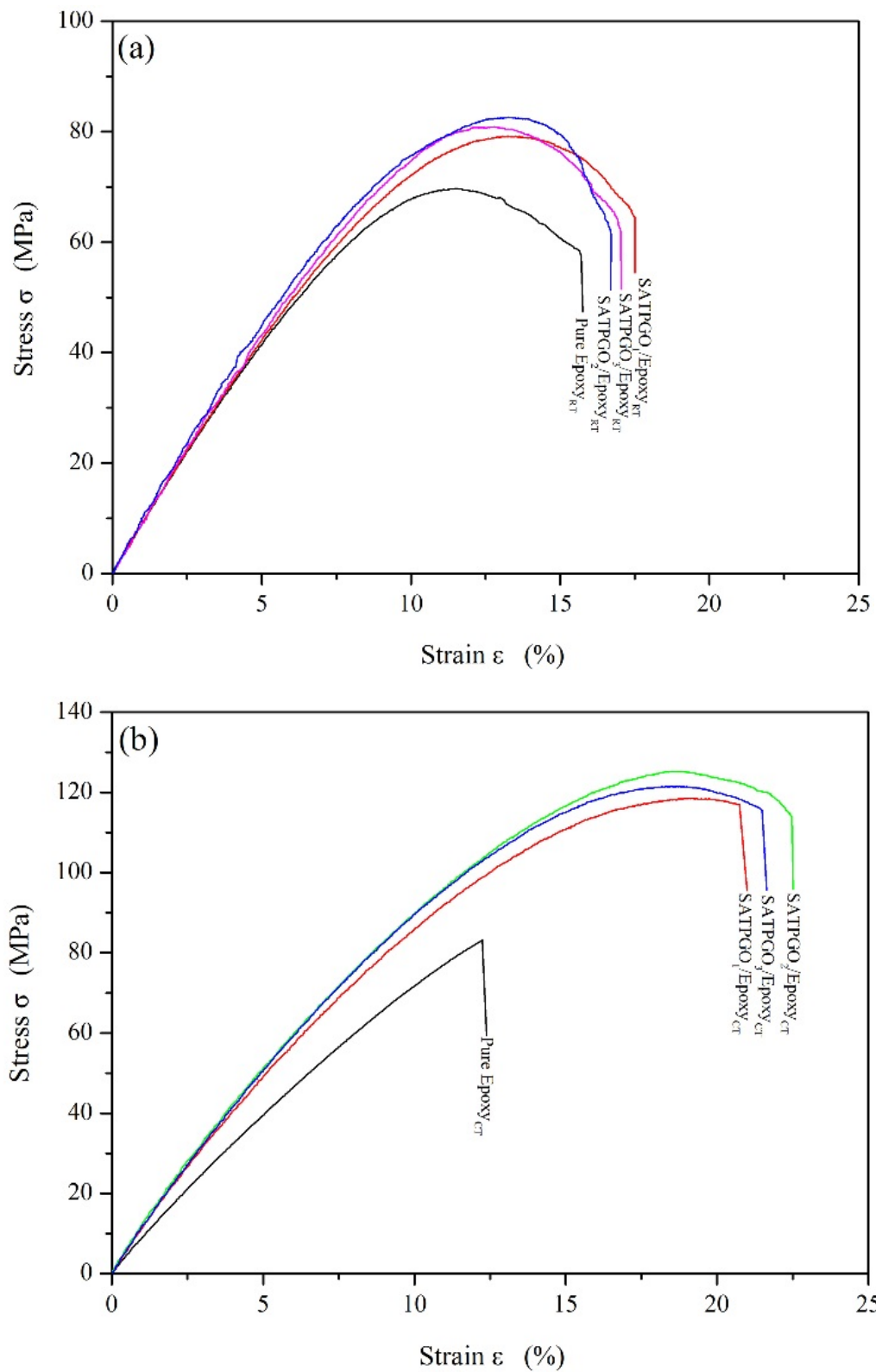
**Fig. S1** AFM images of (a) GO and (b) SATPGO<sub>2</sub>



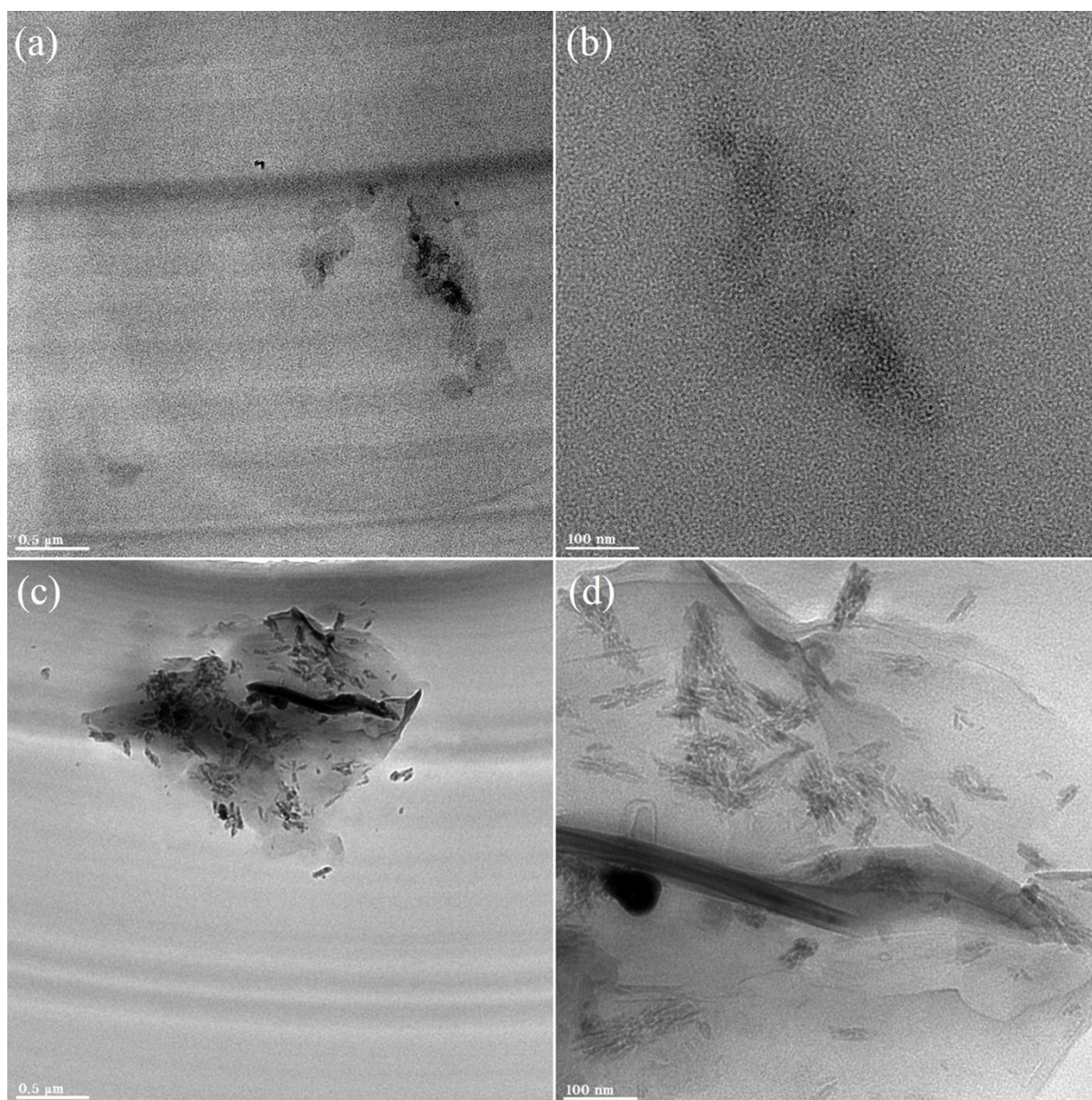
**Fig. S2.** (a) FE-SEM images of SATPGO<sub>2</sub> and (b) Si element mapping.



**Fig. S3** DSC thermograms for pure epoxy and SATPGO<sub>1</sub> (0.5 wt%)/epoxy, SATPGO<sub>2</sub> (0.5 wt%)/epoxy and SATPGO<sub>3</sub> (0.5 wt%)/epoxy.



**Fig. S4** Stress-strain curves of pure epoxy, SATPGO (0.5 wt%) /epoxy composites filled epoxy composites at (a) RT and (b) CT.



**Fig. S5** HR-TEM images of (a and b) SATPGO<sub>2</sub> (0.25 wt%)/epoxy, (c and d) SATPGO<sub>2</sub> (1 wt%)/epoxy.

**Table S1:** TGA data of SiO<sub>2</sub>, SA, SAT, GO, SATPGO<sub>1</sub>, SATTGO<sub>2</sub>, SATTGO<sub>3</sub>, pure epoxy, SATPGO<sub>1</sub> (0.5 wt%)/epoxy, SATPGO<sub>2</sub> (0.5 wt%)/epoxy, and SATTGO<sub>3</sub> (0.5 wt%)/epoxy studied under N<sub>2</sub> and air atmosphere

Sample	Degradation temperature (°C) at 5% weight loss		Degradation temperature (°C) at 15% weight loss		Degradation temperature (°C) at 25% weight loss	
	N <sub>2</sub>	Air	N <sub>2</sub>	Air	N <sub>2</sub>	Air
SiO <sub>2</sub>	451	-----	-----	-----		
SA	243	-----	525	-----	692	-----
SAT	146	-----	364	-----	475	-----
GO	104	-----	189	-----	211	-----
SATPGO <sub>1</sub>	107	-----	388	-----	508	-----
SATTGO <sub>2</sub>	189	-----	466	-----	592	-----
SATTGO <sub>3</sub>	128	-----	449	-----	575	-----
pure epoxy	342	332	355	369	360	374
SATPGO <sub>1</sub> (0.5 wt%)/epoxy	344	332	355	371	359	375
SATPGO <sub>2</sub> (0.5 wt%)/epoxy	347	350	357	371	361	375
SATTGO <sub>3</sub> (0.5 wt%)/epoxy	345	346	356	370	361	374