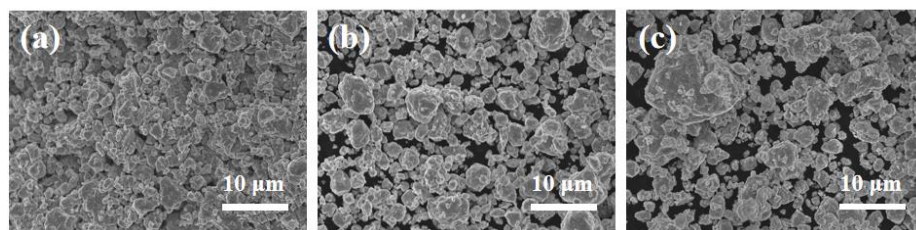


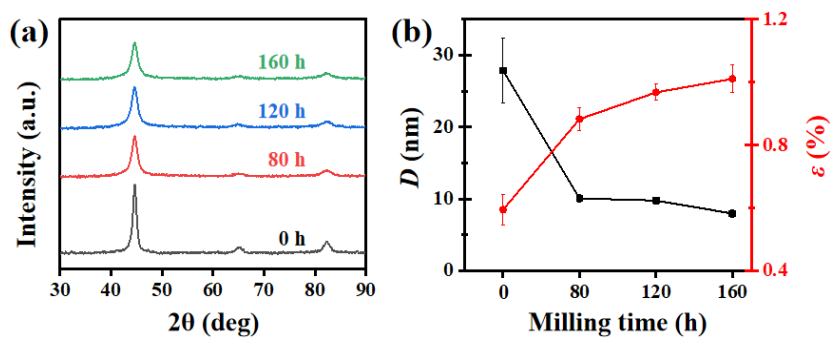
**Figure S1.** EDS images of raw SiBaFe alloy particles.

**Table S1.** Composition (except C and O) of raw SiBaFe alloy particles.

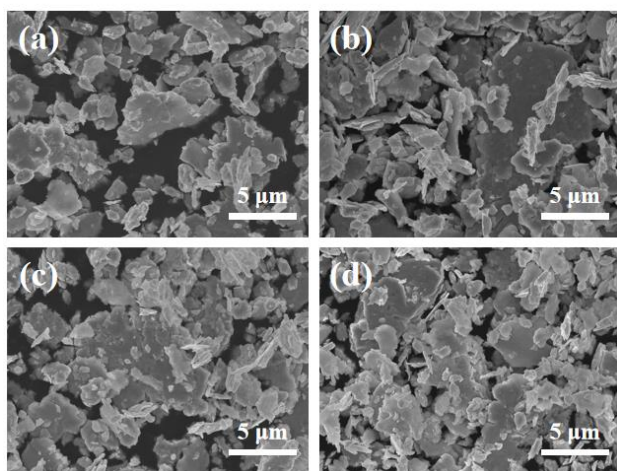
Elements	Si	Ba	Fe	Ca
Contents (wt.%)	$50.93 \pm 4.04$	$28.98 \pm 3.44$	$17.40 \pm 2.31$	$2.69 \pm 1.31$



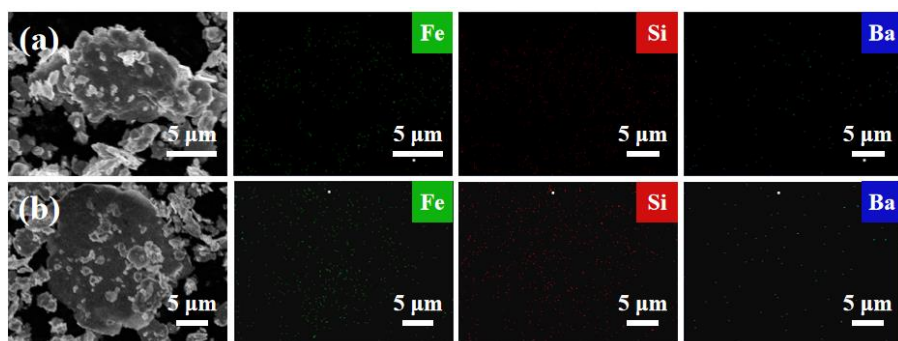
**Figure S2.** (a-c) SEM images of (a) CI, (b) CI/SiBaFe-5 and (c) CI/1SiBaFe-10 particles.



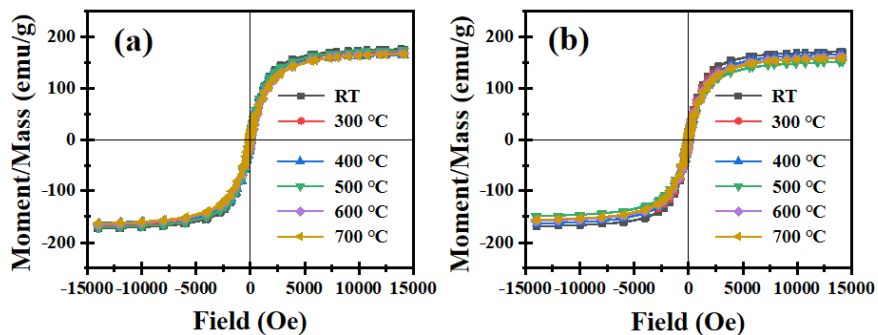
**Figure S3.** (a) XRD spectra, (b) grain size and internal strain of Cl/SiBaFe-15 particles before and after milling for different times.



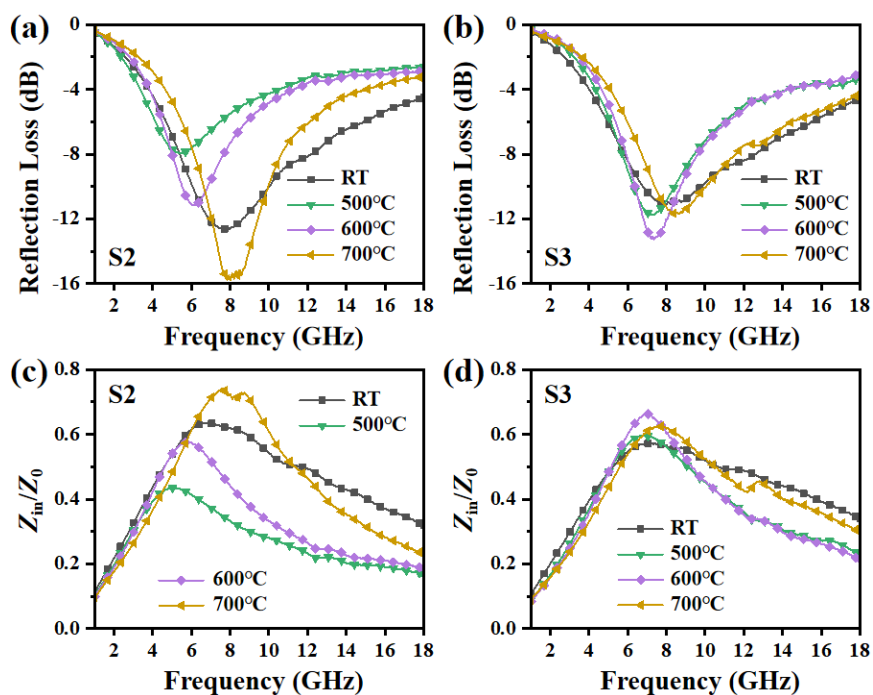
**Figure S4.** (a-d) SEM images of flaky (a) Cl, (b) Cl/SiBaFe-5, (c) Cl/1SiBaFe-10 and (d) Cl/1SiBaFe-15 particles after attritor ball milling.



**Figure S5.** (a,b) EDS images of (a) flaky Cl/SiBaFe-5 and (b) Cl/SiBaFe-10 particles.



**Figure S6.** Hysteresis loops of flaky (a) CI/SiBaFe-5 and (b) CI/SiBaFe-10 particles before and after heat treatment.



**Figure S7.** (a,b) Microwave absorption of (a) CI/SiBaFe-5 and (b) CI/SiBaFe-10 particles; (c,d) impedance matching analysis for (c) CI/SiBaFe-5 and (d) CI/SiBaFe-10 particles before and after heat treatment.