Electronic Supplementary Information for:

An All-Inorganic, Fully Dense, Stretchable Ceramic Magnetic Film

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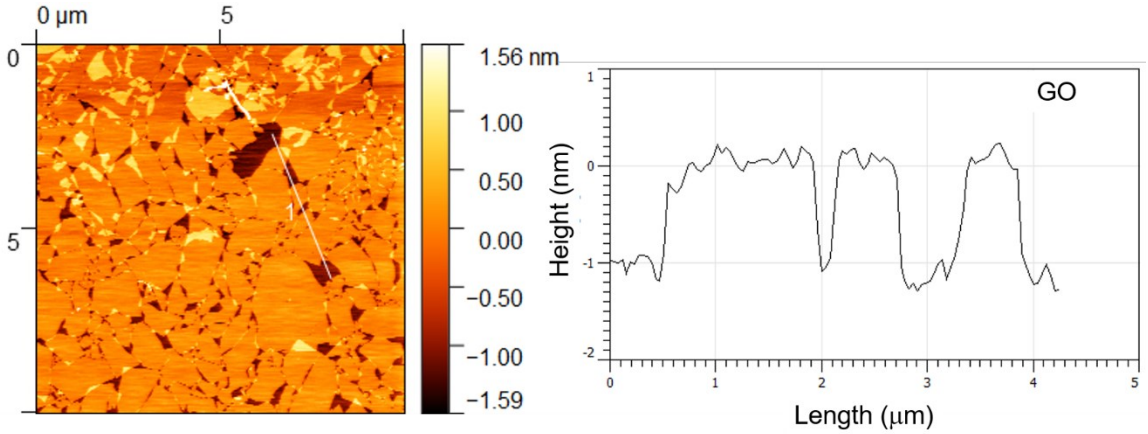

Fig. S1. Morphologies of GO nanosheets. AFM image and accompanying height profile of GO nanosheets drop-cast from diluted suspension onto plasma treated mica. GO nanosheets show lateral size of ~1 µm, and thickness of ~1 nm.

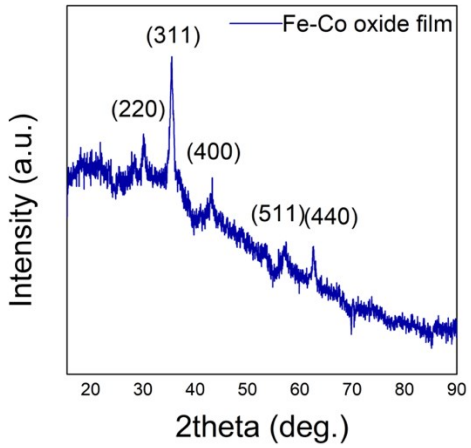

Fig. S2. XRD spectrum of cobalt ferrite pre-folded films (SMOF).

Fig. S3 shows results of thermal gravimetric analysis of GO-Fe(III)/Co(II) films, GO and $Fe(NO_3)_3/Co(NO_3)_2$ salts carried out in air at a heating rate of 10 °C min^{-1}. From the TGA curves we can see the decomposition of $Fe(NO_3)_3/Co(NO_3)_2$ is complete at ~200 °C with weight retention of 32.8%, which is close to theoretical value ($CoFe_2O_4$/[2*$Fe(NO_3)_3$+$Co(NO_3)_2$] =35.1%). During the annealing of GO, the first weight loss at ~200 °C is caused by the thermal decomposition and deoxygenation GO, while the second weight loss at ~450 °C is rGO oxidation. In GO-Fe(III)/Co(II) films, the weight retention (25.1%) is also close to theoretical value ($CoFe_2O_4$/[2*$Fe(NO_3)_3$+$Co(NO_3)_2$+GO] =20.1%). Since GO is fully oxidized over 500 °C, the formation of $CoFe_2O_4$ must be occurring while the graphene-based scaffold is intact, which enables the 2D assembly and replication of wrinkled topographies.

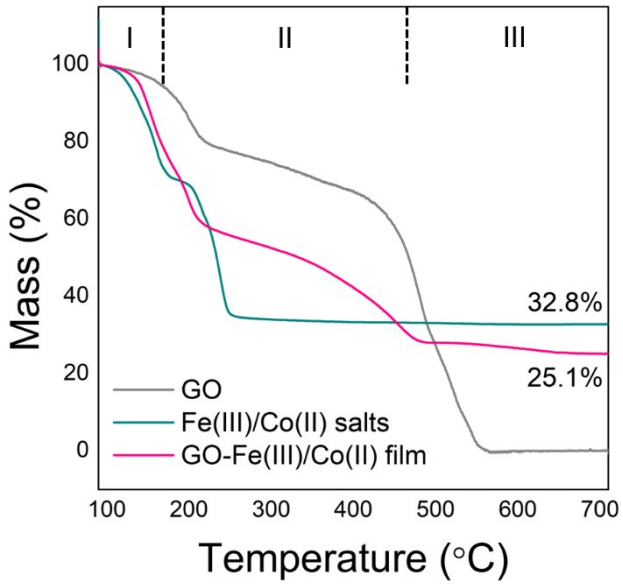

Fig. S3. TGA curves of GO-Fe(III)/Co(II) films, GO and $Fe(NO_3)_3/Co(NO_3)_2$ salts in air. The salts start to decompose at ~180 °C (phase I). The thermal reduction of GO to rGO takes place between 150 to 200 °C (phase II) and the combustion of rGO starts at 450 °C (phase III). The transformation of $Fe(NO_3)_3/Co(NO_3)_2$ salts to $CoFe_2O_4$ is completed at ~200 °C, while GO is fully oxidized over 500 °C. Heating rate: 10 °C min^{-1}.

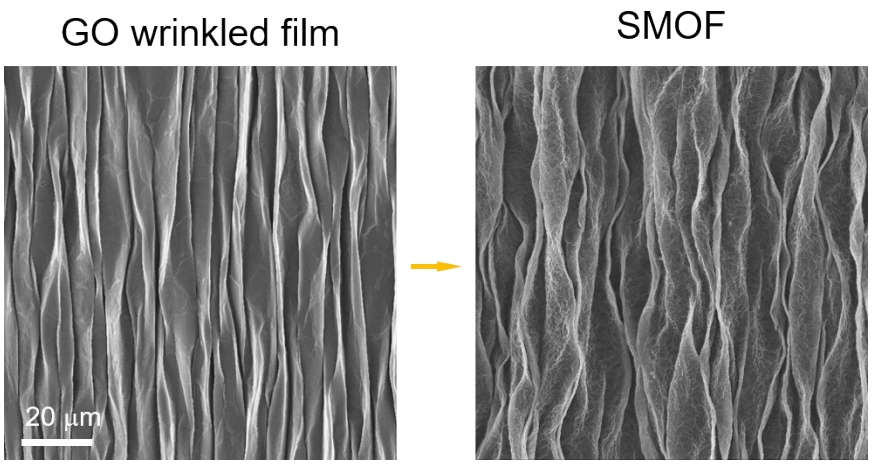

Fig. S4. Surface morphologies of GO wrinkled film and SMOF. Scale bar, 20 μm.

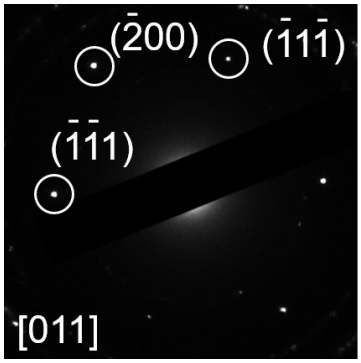

Fig. S5. SAED of $CoFe_2O_4$ single nanoplatelet. The resulting nanoplatelet with basal surfaces that are primarily (011) planes.

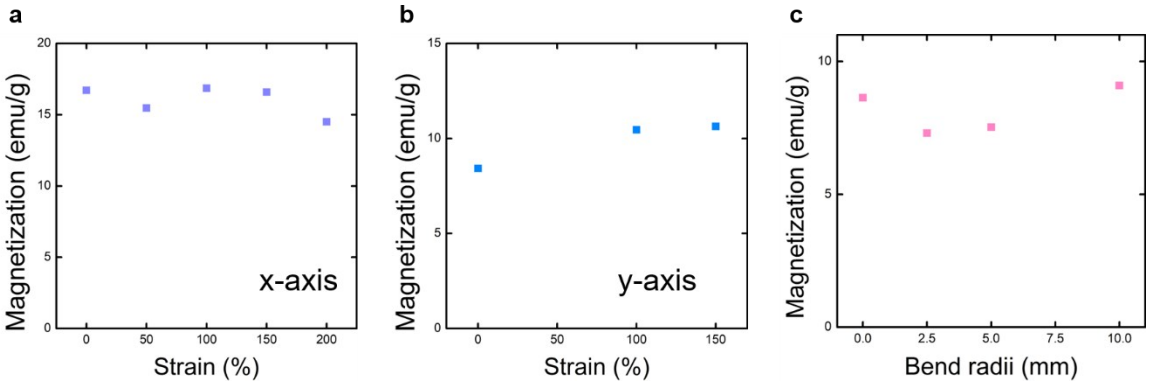

Fig. S6. Remnant magnetization of SMOFs (a) long x-axis during stretching, (b) along y-axis during stretching and (c) along x-axis during bending.