

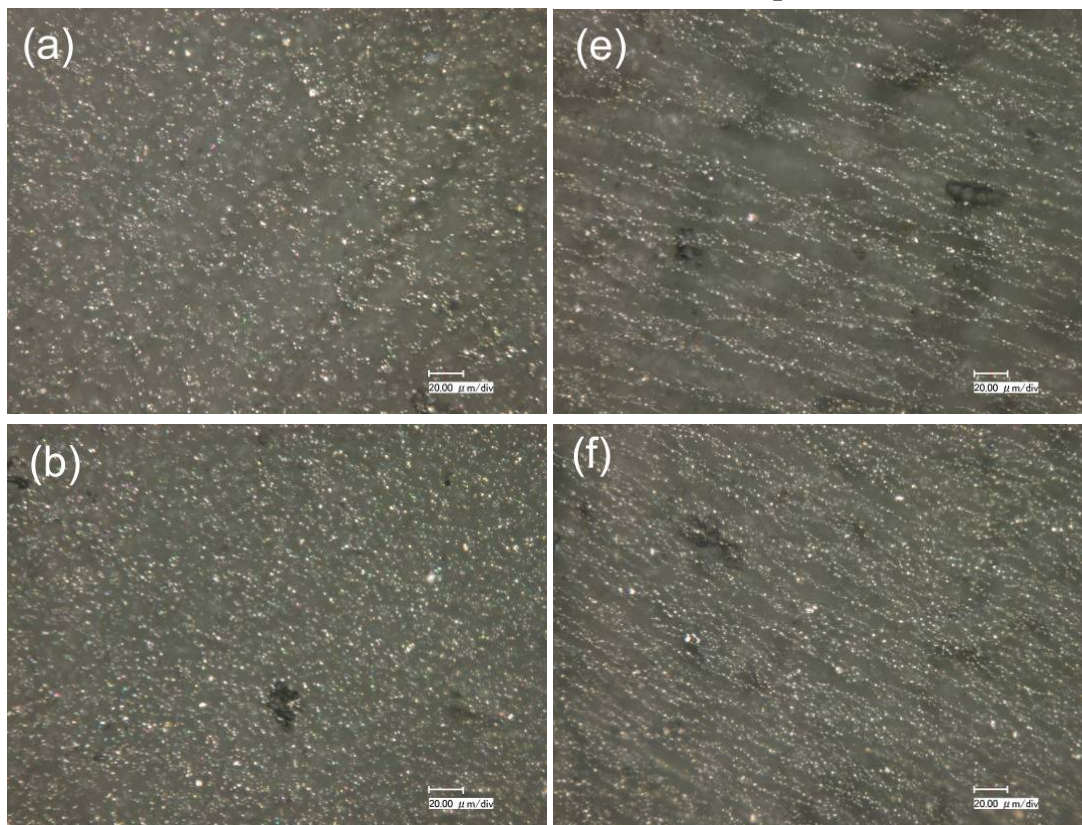
Supplementary Information

High-Performance Magnetorheological Material: Preparation, Characterization and Magnetic-Mechanic Coupling Properties

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Microstructures of the MRP materials with different iron particles content:



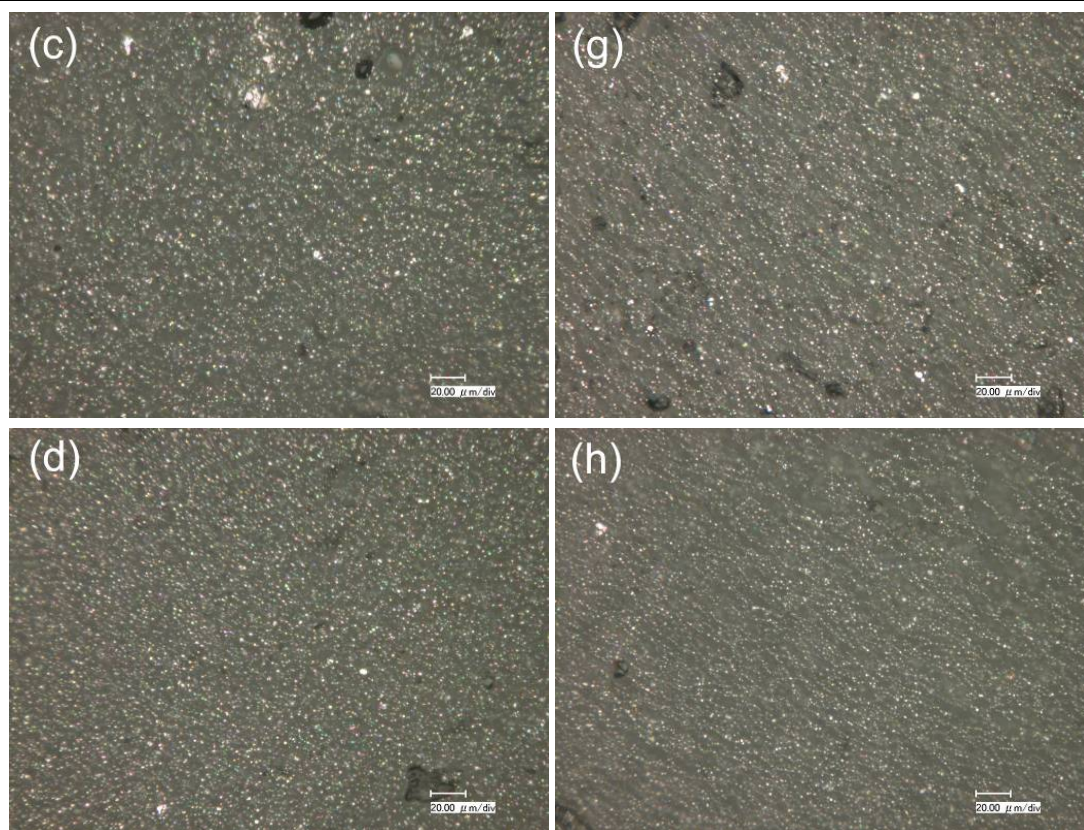


Fig. S1 Optical microscopy images of the MRP with different iron particles content: (a)-(d) I-MRP-40, I-MRP-60, I-MRP-70 , and I-MRP-80, respectively; (e)-(h) A-MRP-40, A-MRP-60, A-MRP-70 , and A-MRP-80, respectively; the scale bar on the images corresponds to 20 microns.

Description: The white bright spots in Fig. S1 stand for the position of iron particles and the dark background is the matrix. A homogeneous distribution of the particles can be observed in Fig. S1a-S1d, which proves the MRP materials are isotropic without pre-configuration. Fig. S1e is for A-MRP-40, it is found that all the iron particles are assembled to form chain like structures aligned parallel to the magnetic field direction as expected. When the iron particles content increases to 60 wt%, more chains are formed and the distances between the strings decrease clearly (Fig. S1f). However, with further increase of the iron particles proportion, it is more and more difficult to distinguish particle chains because they are close to each other (Fig. S1g

and S1h).

The influence of pre-configuration time on storage modulus:

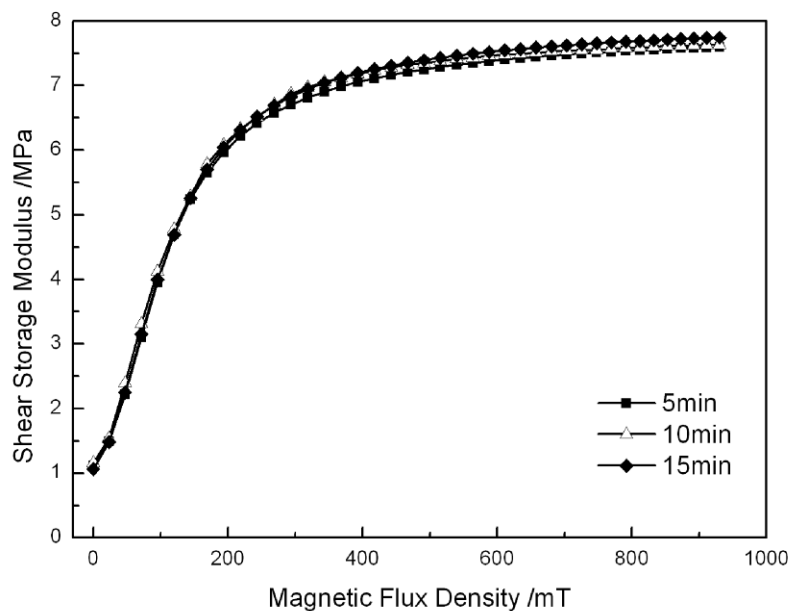


Fig. S2 Storage moduli of A-MRP-80 under different magnetic flux density with different pre-configuration time.

Description: From Fig. S2, it can be seen that different pre-configuration time has little influence on the storage modulus of A-MRP-80, which indicates that the particle chains have been formed adequately if pre-configuration time was set as 10 minutes under a 800 mT magnetic field. Therefore, 10 minutes was chosen for pre-configuration time is reasonable.