

Experimental section:

Synthesis of magnetite nanoparticles

Fe^{3+} and Fe^{2+} salts were added to an aqueous medium in a 2:1 molar ratio and stirred for 30 minutes. The solution was heated at 80°C followed by addition of ammonia. As the pH of the solution reached 10, 0.1M aqueous solution of citric acid was added as a capping agent to encapsulate magnetite nanoparticles and prevent agglomeration. The solution was heated at 90°C for 90 minutes to complete the reaction. As obtained precipitate was washed twice with ethanol, ethanol/deionized water mixture and then with pure deionized water several times. The washed precipitate was air dried at 80°C for 24 hours and used for further studies and characterizations.

Synthesis of silica sol

A 2-propanol and 2-butanol solution mixture was prepared in a 1:1.3 molar ratio. The above solution was split into two equal parts, namely Part A and Part B. To Part A of the solution, TEOS was added dropwise under continuous stirring at 350 rpm for 1 hour to obtain 1.15M sol. DIW and Nitric acid (1N) (catalyst) was added to part B of the solution dropwise wherein the DIW: TEOS and Nitric acid: TEOS molar ratios corresponded to 1:6 and 1:26 respectively. This solution was subsequently added to part A dropwise under continuous stirring at 350 rpm and room temperature for 1 hour resulting in a 6 wt% silica sol.

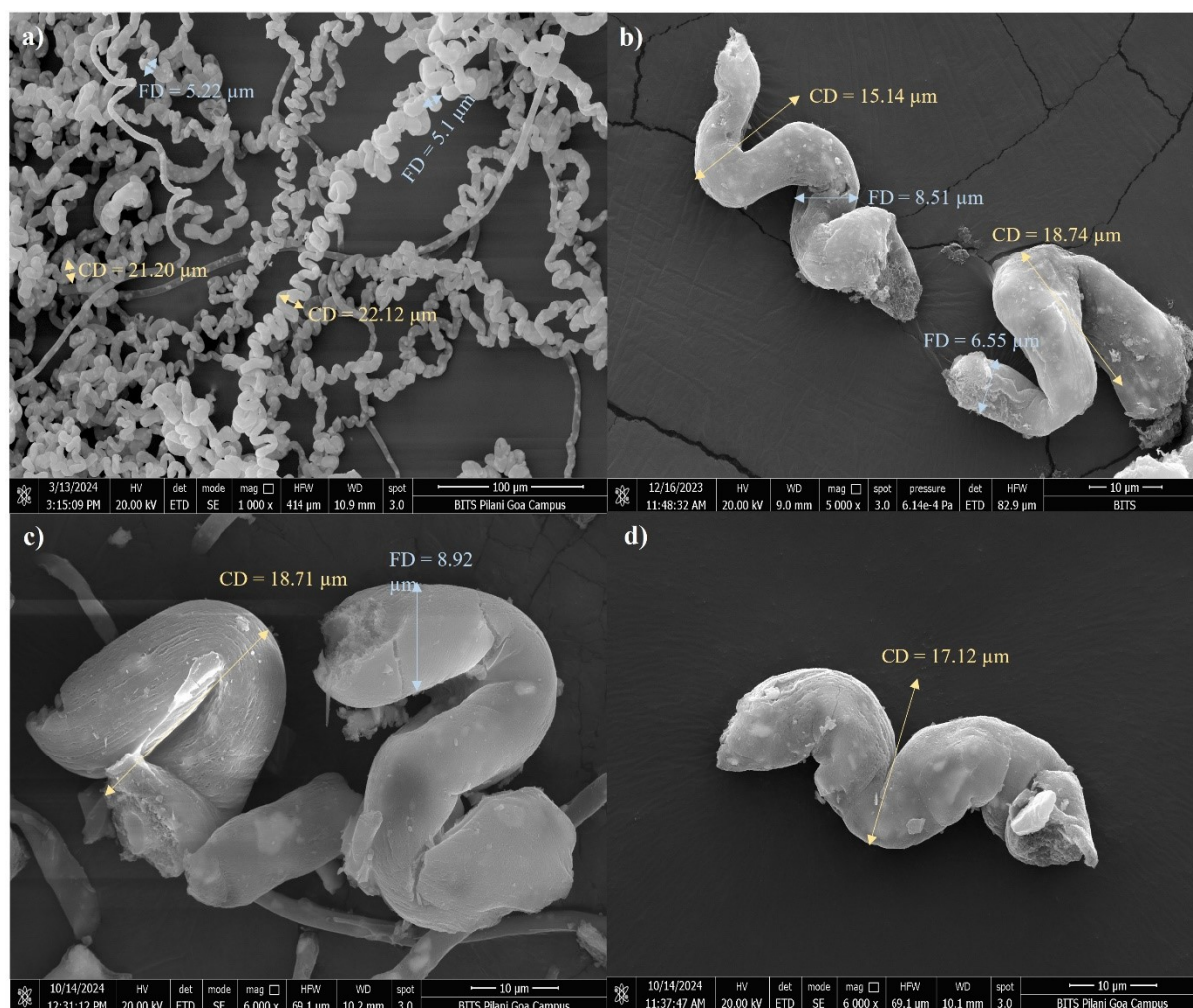


Figure S1. Representative electron micrograph of the measurement of fiber diameter (FD) and coil diameter (CD) of the (a) HMPF; (b), (c) and (d) Si-HMPF. Several such images of different magnifications were used to determine the average coil diameter (ACD) and average fiber diameter (AFD) values for both HMPF and SiHMPF. A sample size of 25 individual fibers were used to calculate the average and standard deviation data.

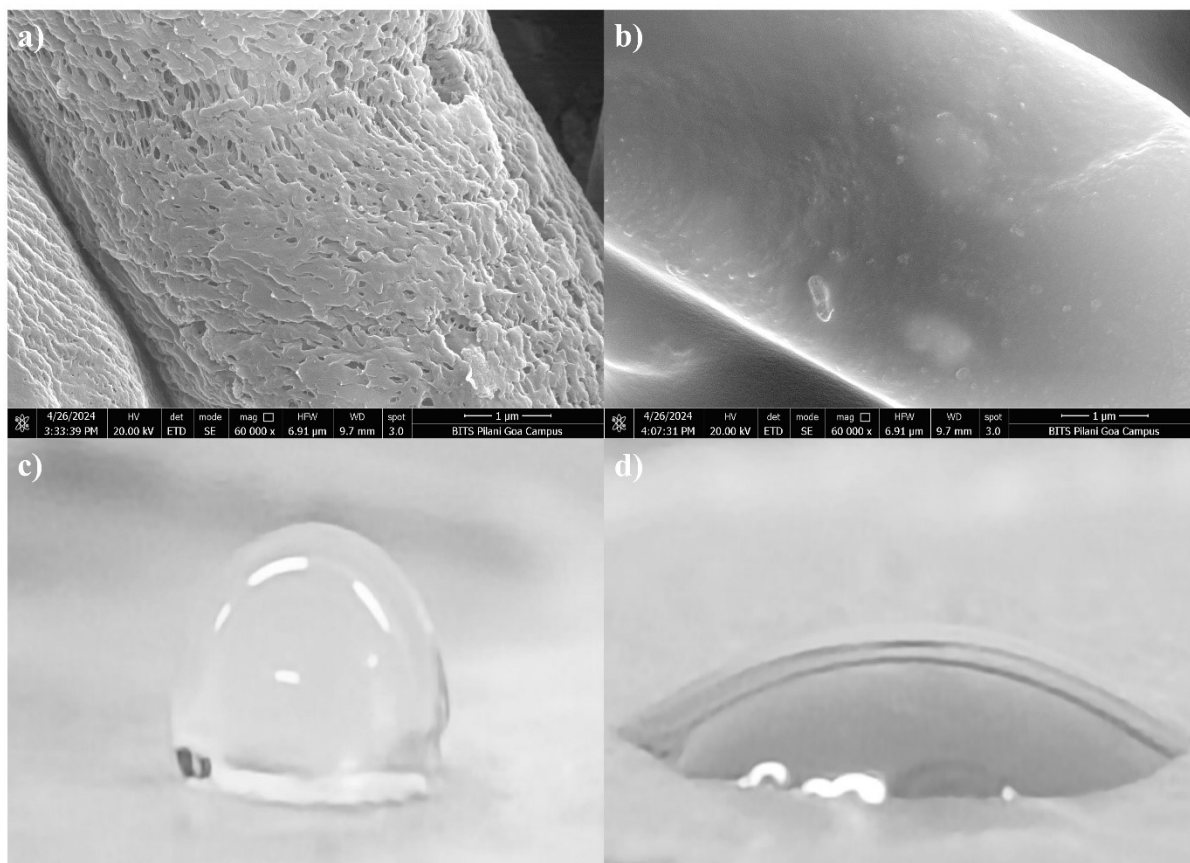


Figure S2. High magnification FESEM images of a) HMPF, (b) Si-HMPF; Static water contact angle measurements of (c) HMPF pellet and, (d) Si-HMPF pellet samples.

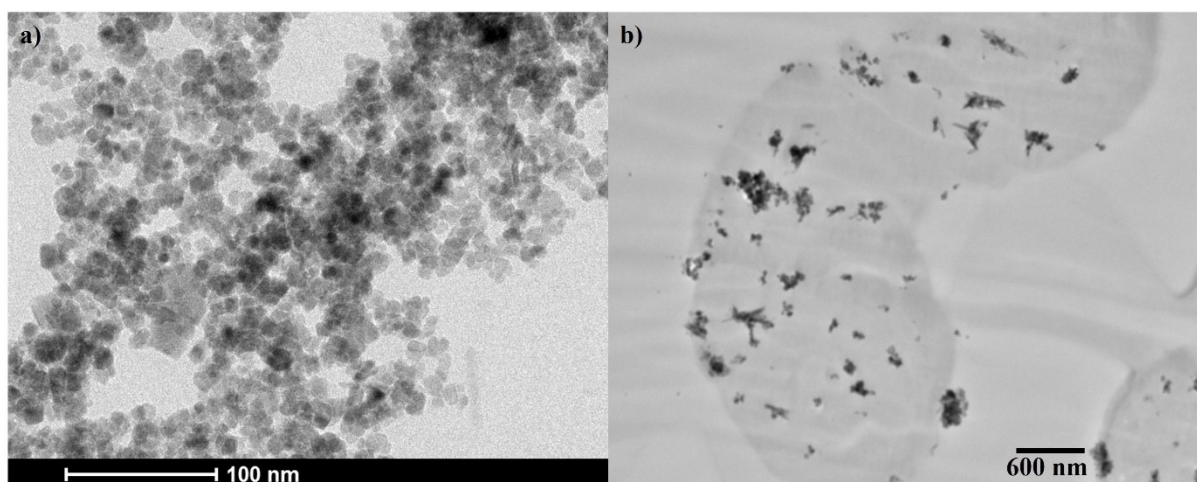


Figure S3. HRTEM images of (a) MNP and (b) Si-HMPF sample.

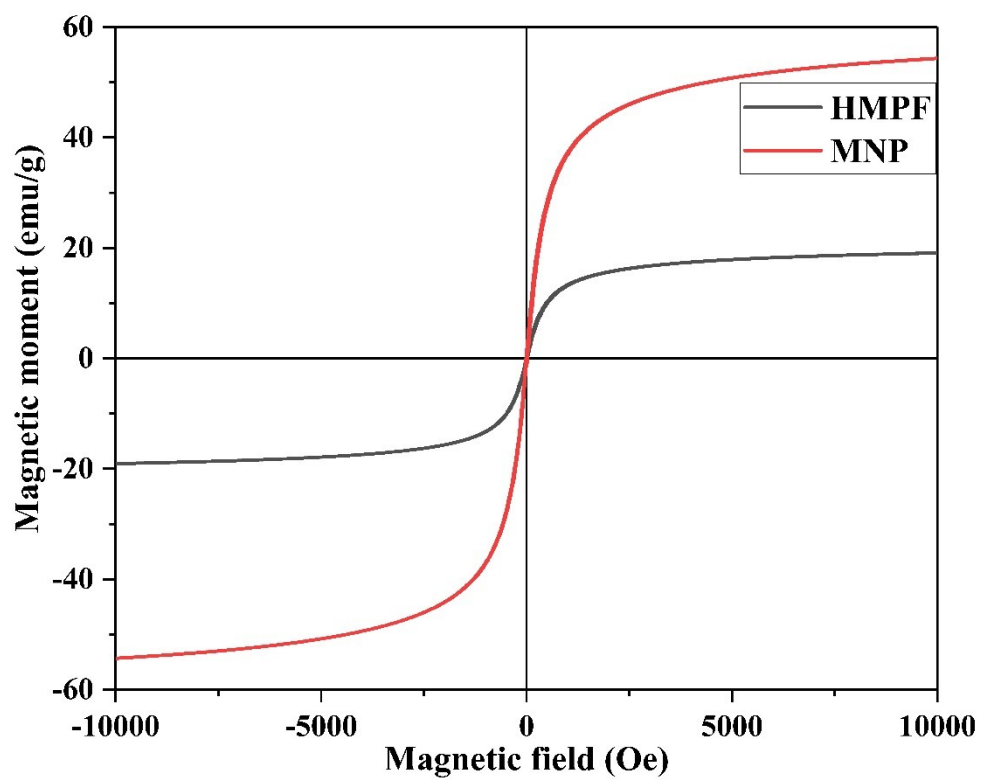


Figure S4. VSM plot to determine the magnetic properties of the MNP and HMPF samples.