Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Polarization enhanced three-dimensional $Co_3O_4/MoO_2/C$ flower as an efficient microwave absorber

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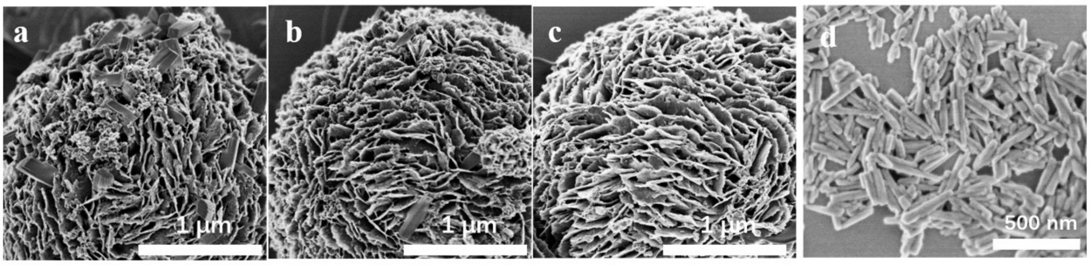

Figure S1 SEM imagines of CMC intermediates in 10 min (a), 15 min (b), and 20 min (c) which obtained by hydrothermal reaction, and $CoMoO_4$ nanowires (d).

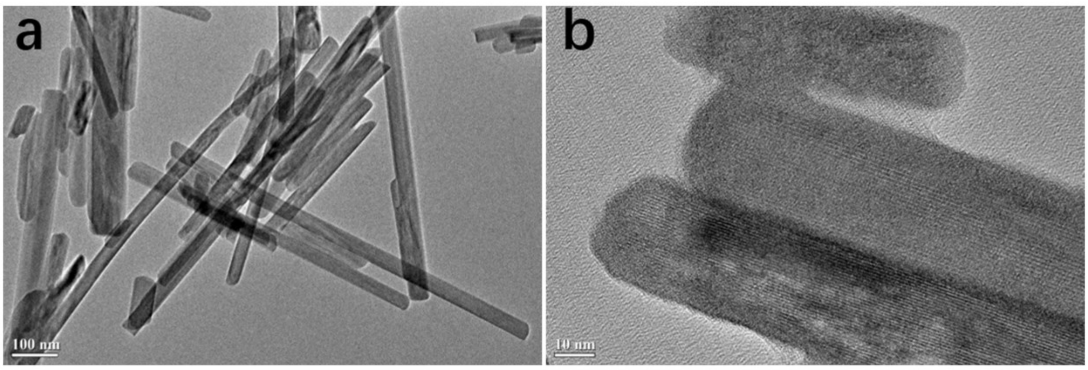

Figure S2 TEM and HRTEM images of $CoMoO_4$.

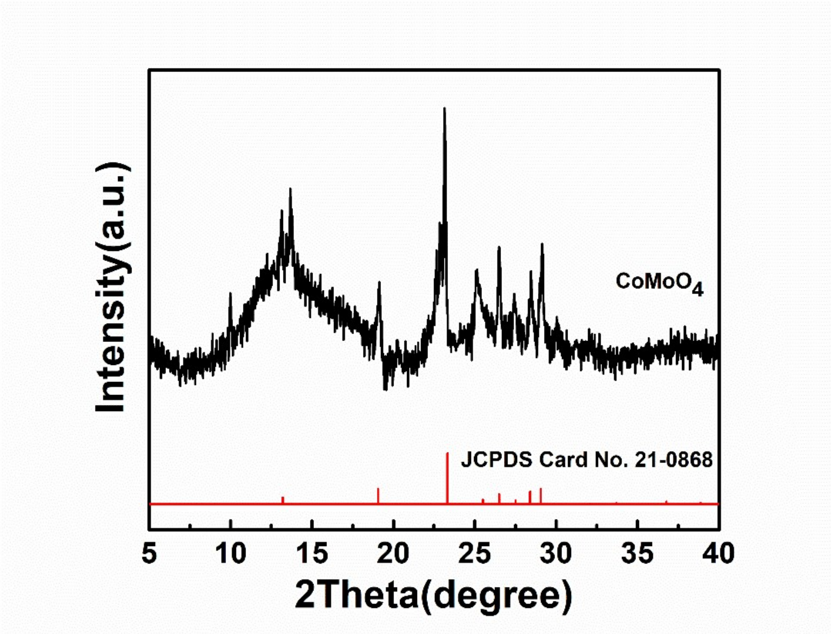

Figure S3 XRD pattern of $CoMoO_4$.

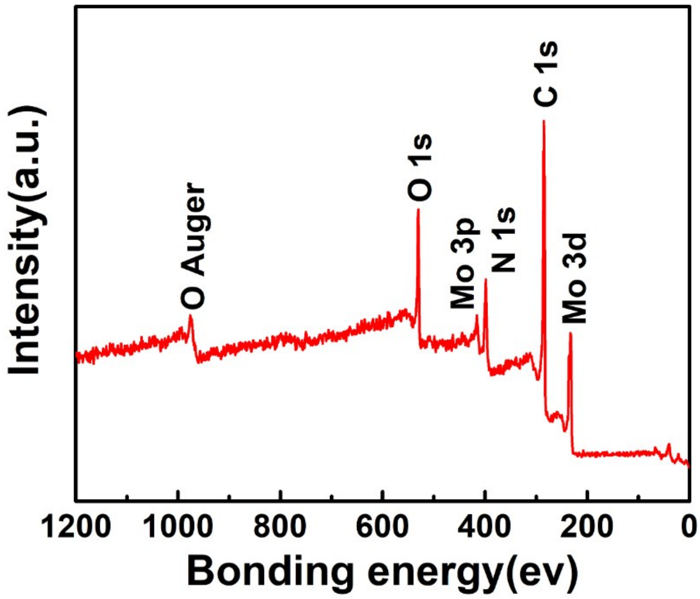

Figure S4 XPS spectra of CMC3.

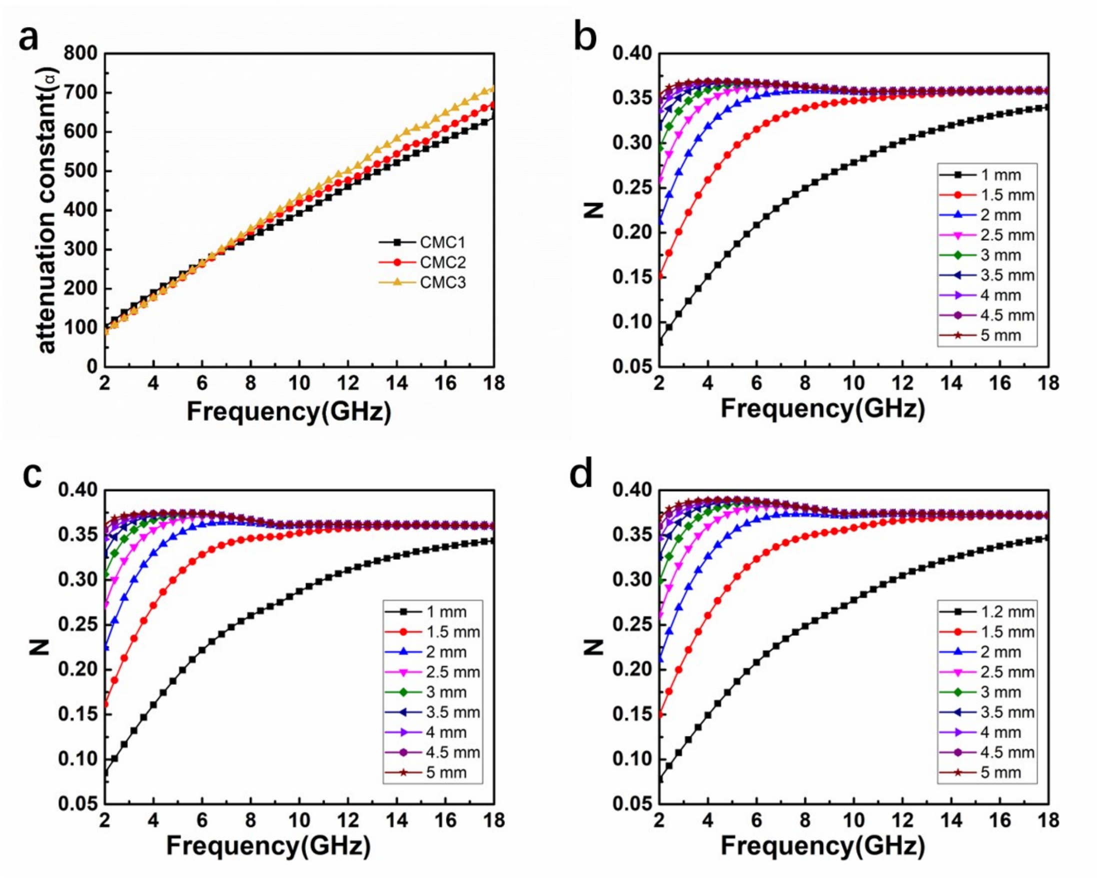

Figure S5 (a) Attenuation constant versus frequency and impedance matching versus frequency for CMC1 (b), CMC2 (c), and CMC3 (d) composites.

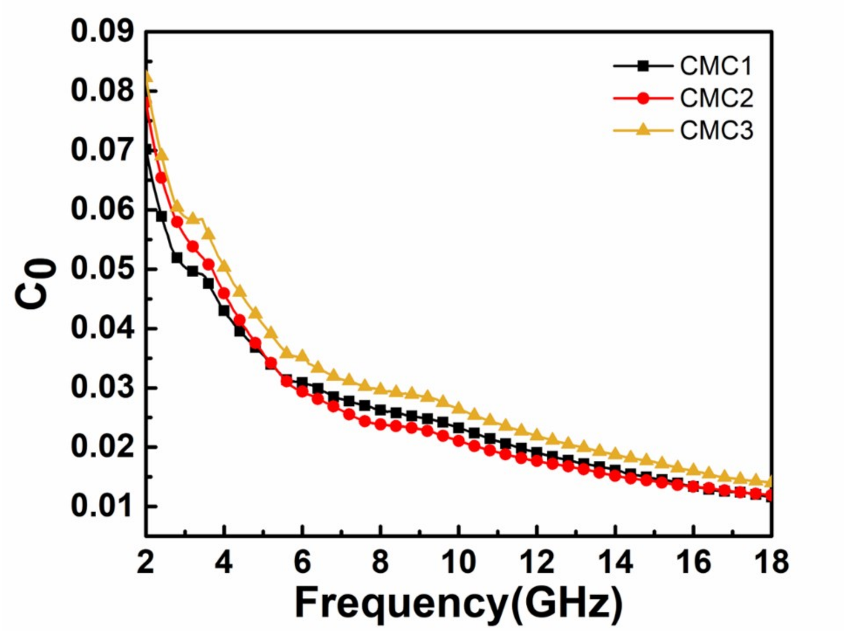

Figure S6 C_0 of three CMC composites.

Principle of electron holography

The interference fringes were formed by the electrified biprism along the transmitting direction of the electron beam and carried electrostatic potential information within the sample. *Via* a fast Fourier transformation (FFT) method, the changing phases are precisely determined by the interference fringes, which can clearly reflect the electrostatic potential distributions on the inner and outer particle surfaces. On the basis of the simplified Poisson's equation of electrostatic field theory and interrelated with the variations of potential, the charge density of materials can be calculated by

$$\rho(\chi) = -\varepsilon_\gamma \varepsilon_0 \frac{\partial^2 v(\chi)}{\partial \chi^2} \qquad (6)$$

where $\rho(\chi)$ is the charge density, χ is the distance, and ε_γ and ε_0 are the relative dielectric constant in the sample and the dielectric constant in vacuum, respectively. The local electrical field can be calculated by

$$EF = \frac{dx + idy}{Ce \cdot t \cdot c} \qquad (7)$$

where EF is the local electrical field, dx and dy were calculated by the expansion of the two-dimensional Gaussian convolution kernel, i is an imaginary unit, Ce is the TEM constant, t is the thickness, c is a length-dependent revision constant. The electric field strength is obtained by taking EF modulus.