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Fluffy microrods to heighten the microwave absorption properties through tuning the electronic state of Co/CoO

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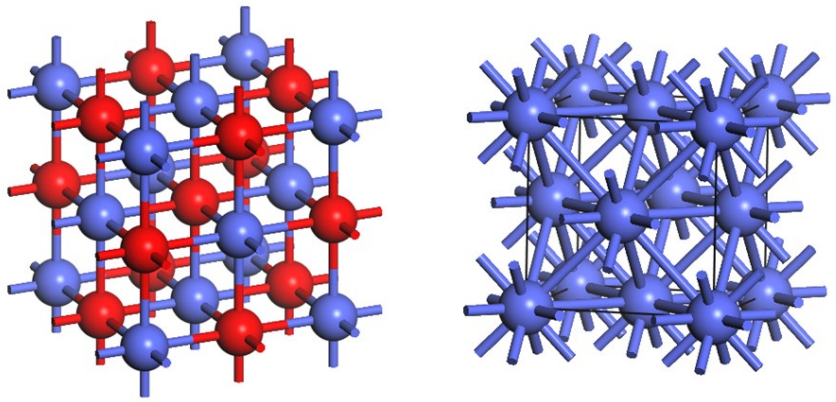

Figure S1. The bulk structures of CoO and Co unit cell after full relaxation: (a) CoO; (b) Co.

Table S1. The sizes of the unit cells of simulated the systems

	Optimized parameter		Experimental results	
CoO bulk	a=b=c=4.28 Å	alpha=beta=gamma=90°	a=b=c=4.26 Å	alpha=beta=gamma=90°
Co bulk	a=b=c=3.53 Å	alpha=beta=gamma=90°	a=b=c=3.54 Å	alpha=beta=gamma=90°

CoO

*data for ICSD #76638

Coll Code 76638

Rec Date 2001/07/16

Chem Name Cobalt Oxide

Structured Co O

Sum Co1 O1

ANX AX

D(calc) 6.44

Title Structure of monoxides of some transition elements at low temperatures

Author(s) Tombs, N.C.;Rooksby, H.P.

Reference Nature (London)

(1950), 165, 442-443

Unit Cell 4.2581(5) 4.2581 4.2581 90. 90. 90.

Vol 77.21

Z 4

Space Group F m -3 m

SG Number 225

Cryst Sys cubic

Pearson cF8

Wyckoff b a

Red Cell F 3.010 3.010 3.010 60 60 60 19.301

Trans Red 0.500 0.500 0.000 / 0.000 0.500 0.500 / 0.500 0.000 0.500

Comments Stable above 271 K

Tetragonal cell at 95 K: 4.2638, 4.2143

The structure has been assigned a PDF number (calculated powder diffraction data): 01-089-7099

The structure has been assigned a PDF number (experimental powder diffraction data): 48-1719

Temperature in Kelvin: 295

Structure type : NaCl

X-ray diffraction from single crystal

No R value given in the paper.

At least one temperature factor missing in the paper.

Atom	#	OX	SITE	x	y	z	SOF	H
Co	1	+2	4 a	0	0	0	1.	0

O 1 -2 4 b 0.5 0.5 0.5 1. 0

*end for ICSD #76638

Co

*data for ICSD #76632

Coll Code 76632

Rec Date 2001/07/16

Chem Name Cobalt - Alpha

Structured Co

Sum Co1

ANX N

D(calc) 8.79

Title Precision measurements of lattice parameters of non-cubic crystals

Author(s) Taylor, A.;Floyd, R.W.

Reference Acta Crystallographica (1,1948-23,1967)

(1950), 3, 285-289

Unit Cell 3.5442 3.5442 3.5442 90. 90. 90.

Vol 44.52

Z 4

Space Group F m -3 m

SG Number 225

Cryst Sys cubic

Pearson cF4

Wyckoff a

Red Cell F 2.506 2.506 2.506 60 60 60 11.13

Trans Red 0.500 0.500 0.000 / 0.000 0.500 0.500 / 0.500 0.000 0.500

Comments Filings annealed at 1173 K for 100 h, quenched

Cell after slowly cooling: 3.545, for Matthey specpure Co: 3.5441

The structure has been assigned a PDF number (calculated powder diffraction data): 01-089-7093

The structure has been assigned a PDF number (experimental powder diffraction data): 15-806

Structure type : Cu

X-ray diffraction from single crystal

Unusual difference between calculated and measured density

No R value given in the paper.

At least one temperature factor missing in the paper.

Atom	#	OX	SITE	x	y	z	SOF	H
Co	1	+0	4 a	0	0	0	1.	0

*end for ICSD #76632

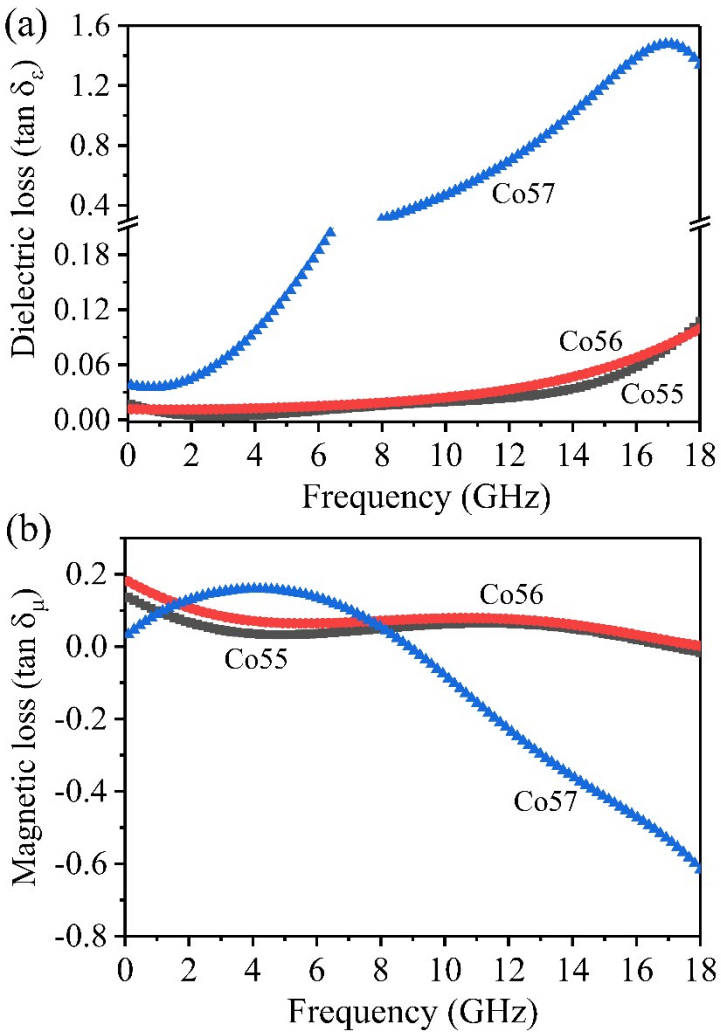

Figure S2. (a) Dielectric loss tan δ_ε and (b) magnetic loss tan δ_μ of various Co@CoO samples.

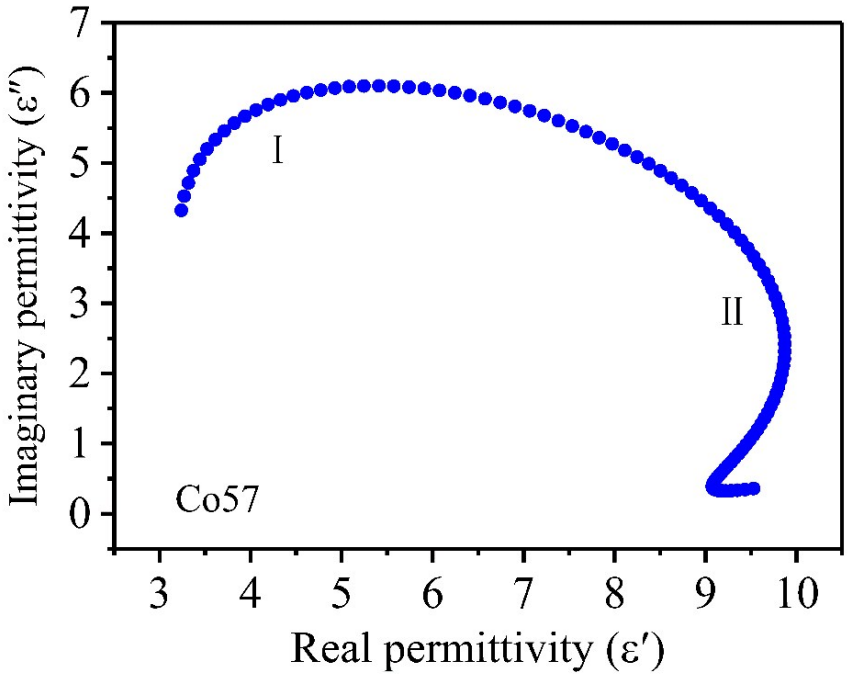

Figure S3. The ε′−ε″ (Cole–Cole Plot) curve of Co57 sample.

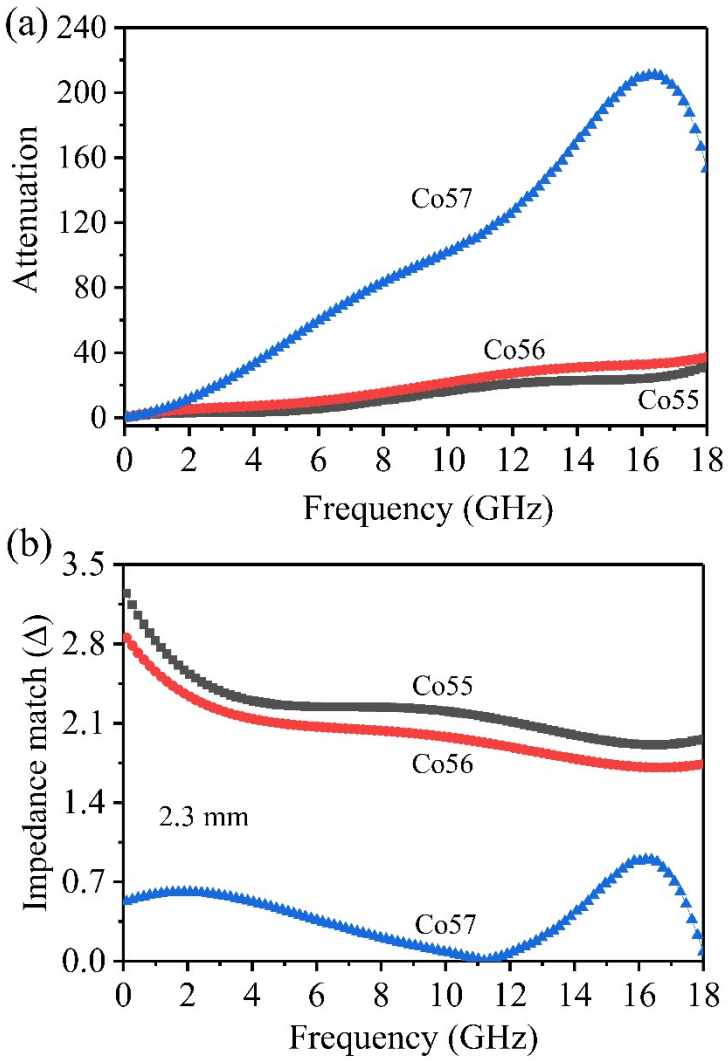

Figure S4. Frequency dependence of (a) attenuation constant (α) and (b) impedance match (Δ) for Co57 sample.