Supplementary Information

**High-entropy ferrite with tunable magnetic properties for excellent microwave absorption**

*Yuying Huo*1,2), *Zhengyan Wang*1,2), *Yanlan Zhang*1,2),🖂, *and Yongzhen Wang*1,2),🖂

1) College of Materials Science and Engineering, Taiyuan University of Technology, Taiyuan 030024, China

2) Shanxi Joint Laboratory of Coal based Solid Waste Resource Utilization and Green Ecological Development, Taiyuan 030024, China

🖂 Corresponding authors: Yanlan Zhang E-mail: zhangyanlan@tyut.edu.cn; Yongzhen Wang E-mail: wangyongzhen@tyut.edu.cn



**Fig. S1.** Schematic process of HEF used as a microwave absorber.



**Fig. S2.** Enlarged XRD patterns of (CoNi)*x*/2(CuZnAl)(1−*x*)/3Fe2O4 (*x* = 0.25, 0.34, 0.40, 0.50).



**Fig. S3.** Matching Rietveld refinement patterns of (CoNi)*x*/2(CuZnAl)(1−*x*)/3Fe2O4 (*x* = 0.25, 0.34, 0.40, 0.50).

**Table S1.** Refined parameters of HEF

|  |  |  |
| --- | --- | --- |
| (Co1/2Ni1/2)*x*(Cu1/3Zn1/3Al1/3)1−*x*Fe2O4 | Lattice constant / Å | *R*wp |
| *x* = 0.25 | 8.348 | 5.55 |
| *x* = 0.34 | 8.355 | 5.51 |
| *x* = 0.40 | 8.351 | 4.49 |
| *x* = 0.50 | 8.353 | 5.33 |

|  |
| --- |
|  |
| **Fig. S4.** Representative EDS elemental mappings of (CoNi)*x*/2(CuZnAl)(1−*x*)/3Fe2O4 (*x* = 0.40). |



**Fig. S5.** XPS patterns of (CoNi)*x*/2(CuZnAl)(1−*x*)/3Fe2O4 (*x* = 0.25, 0.34, 0.40, 0.50) samples.



**Fig. S6.** XPS patterns of (CoNi)*x*/2(CuZnAl)(1−*x*)/3Fe2O4 (*x* = 0.25, 0.34, 0.40, 0.50) samples.

|  |
| --- |
| **Table S2.** Magnetic characteristics of HEF with different *x* values obtained from VSM |

|  |  |  |
| --- | --- | --- |
| *x* | *M*s / (A·m2·kg−1) | *H*c / mT |
| 0.25 | 62.47 | 3.60 |
| 0.34 | 58.73 | 5.46 |
| 0.40 | 58.10 | 6.26 |
| 0.50 | 62.77 | 8.38 |