

## Iron catalyzed graphitization of biomass Supplementary Information

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### Supplementary experimental information

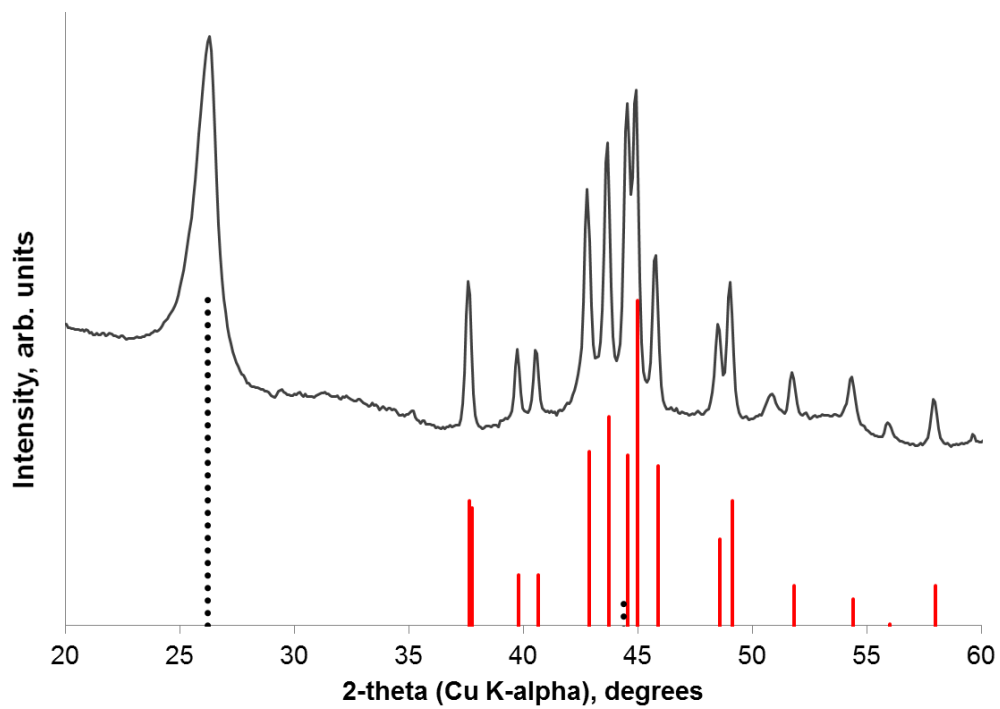
Fe:Ca molar ratio	Volume of 10% Fe(NO <sub>3</sub> ) <sub>3</sub> ·9H <sub>2</sub> O solution (ml)	Volume 10% Ca(NO <sub>3</sub> ) <sub>2</sub> ·4H <sub>2</sub> O solution (ml)	Volume of water (ml)
100:0	20	0	0
75:25	15	2.92	2.08
50:50	10	5.84	4.16
25:75	5	8.77	6.23
10:90	2	10.52	7.48
0:100	0	11.69	8.31

Fe:Mg molar ratio	Volume of 10% Fe(NO <sub>3</sub> ) <sub>3</sub> ·9H <sub>2</sub> O solution (ml)	Volume 10% Mg(NO <sub>3</sub> ) <sub>2</sub> ·6H <sub>2</sub> O solution (ml)	Volume of water (ml)
100:0	20	0	0
75:25	15	3.17	1.83
50:50	10	6.35	3.65
25:75	5	9.52	5.48
10:90	2	11.42	6.58
0:100	0	12.69	7.31

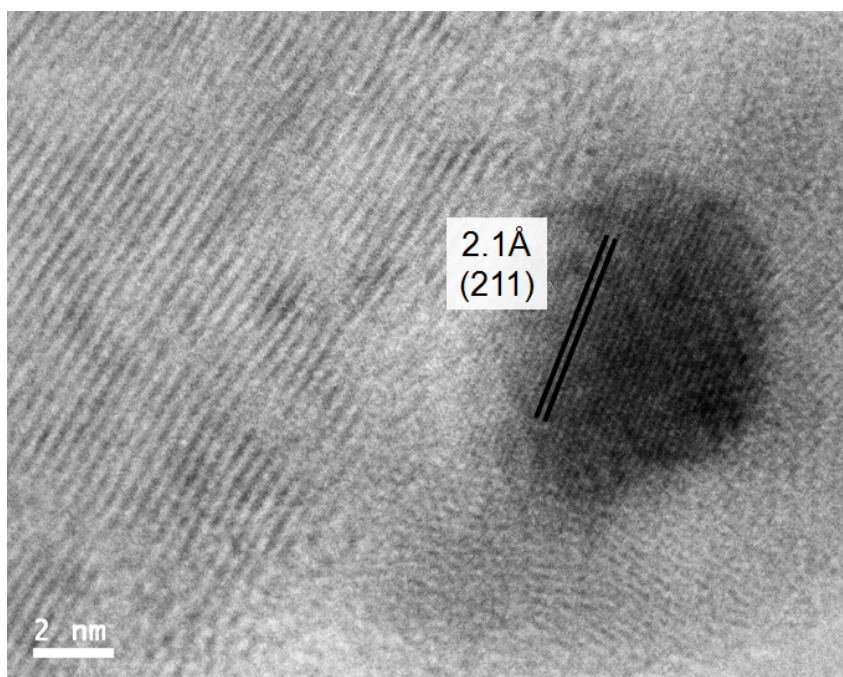
**Table S1** Full details of samples prepared from Fe/Ca and Fe/Mg. Final solution volume of 20 ml was added to 5 g of sawdust.



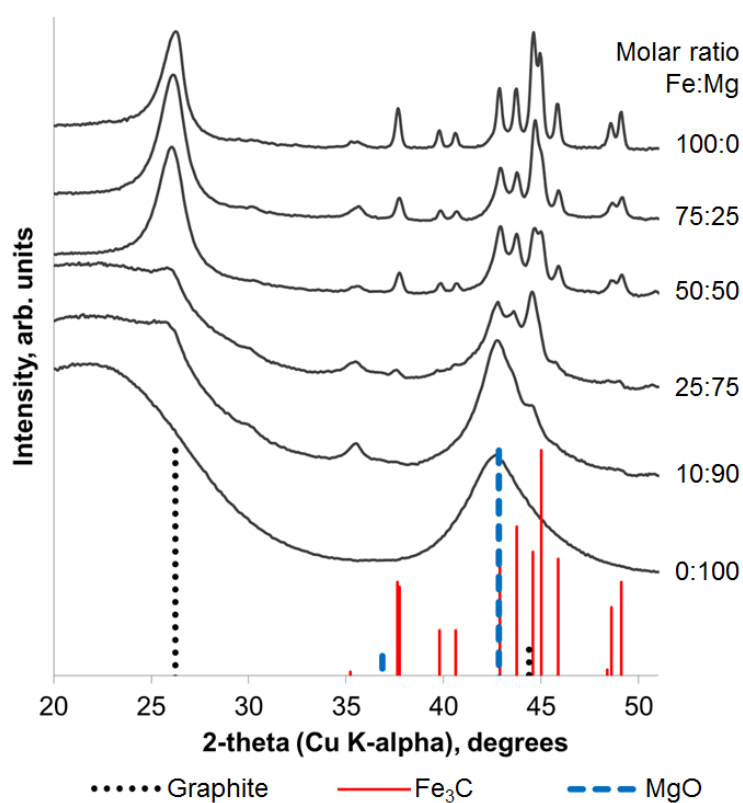
**Figure S1** Photograph of the carbonized sawdust, showing individual flakes of wood have maintained their shape.



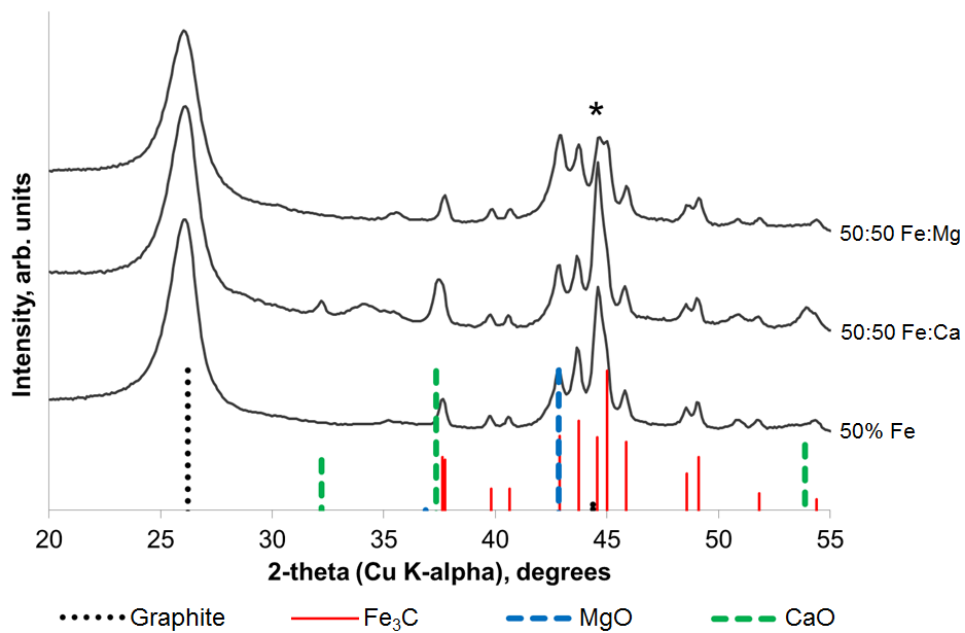
**Figure S2** Powder X-ray diffraction pattern of a sample prepared at a 1 litre scale showing the same crystallographic profile is achieved.



**Figure S3** TEM image of a nanoparticle with lattice planes assigned to  $\text{Fe}_3\text{C}$ .



**Figure S4** Powder XRD patterns for samples prepared by carbonizing sawdust after soaking in a solution of iron and magnesium nitrates.



**Figure S5** Powder XRD patterns for samples prepared using 50% concentration iron nitrate and either water, calcium nitrate or magnesium nitrate (at 50:50 molar ratio for metals).