

### *Supplementary Information*

## Heat dissipating multi-component inorganic mixture of iron with high-temperature dielectric behaviour

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S. No	FPN2A	FPN2B	Vibrational bands
1	3478.16 cm <sup>-1</sup>	3481.35 cm <sup>-1</sup>	O-H Stretching
2	3171.22 cm <sup>-1</sup>	3167.97 cm <sup>-1</sup>	N-H asymmetric stretching
3	1627.98 cm <sup>-1</sup>	1636.88 cm <sup>-1</sup>	H-O-H bending
4	1402.85 cm <sup>-1</sup>	1401.09 cm <sup>-1</sup>	N-H bending
5	1044.52 cm <sup>-1</sup>	1045.77 cm <sup>-1</sup>	<b>PO<sub>4</sub><sup>3-</sup></b> asymmetric stretching
6	820.54 cm <sup>-1</sup>	812.91 cm <sup>-1</sup>	<b>PO<sub>4</sub><sup>3-</sup></b> symmetric stretching
7	546.49 cm <sup>-1</sup>	541.35 cm <sup>-1</sup>	<b>PO<sub>4</sub><sup>3-</sup></b> bending mode
8	471.23 cm <sup>-1</sup>	487.67 cm <sup>-1</sup>	<b>PO<sub>4</sub><sup>3-</sup></b> (ν <sub>2</sub> ) mode

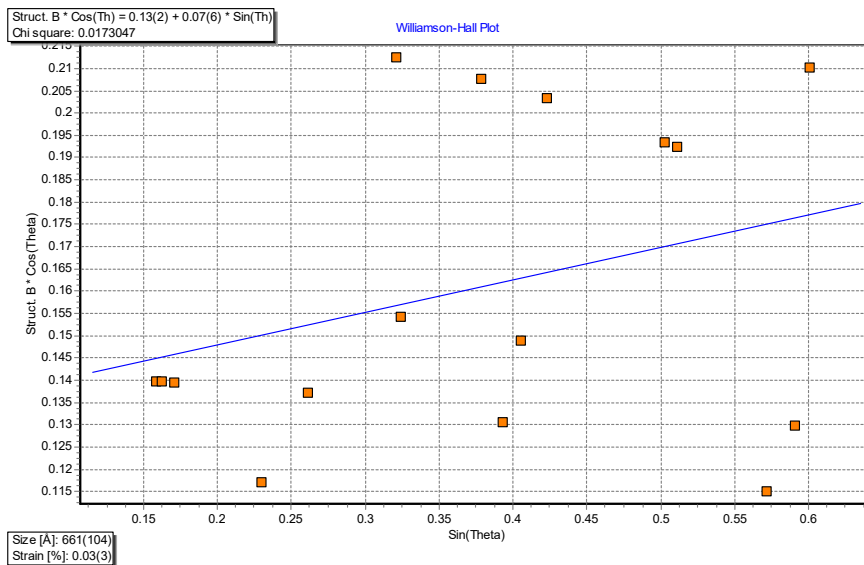


Fig.S1. Williamson-Hall plot of FPN2A

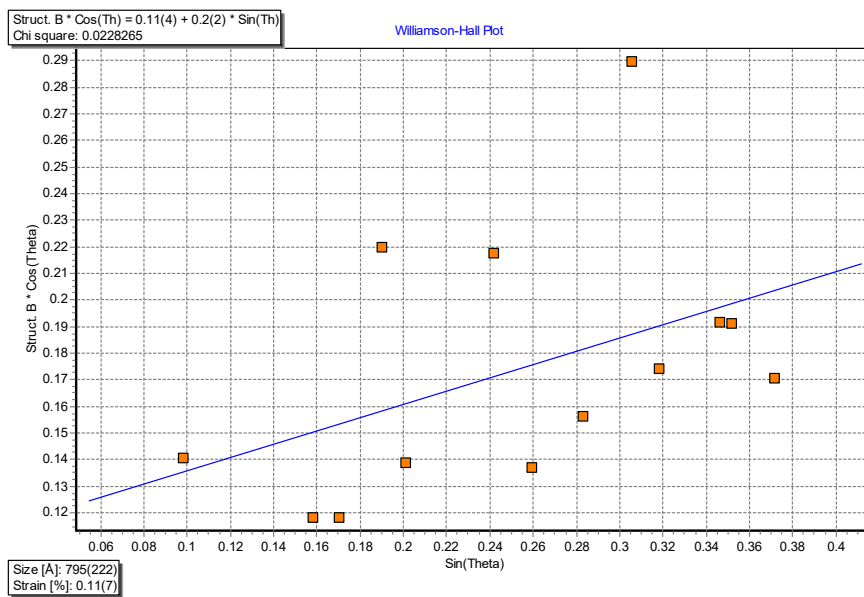
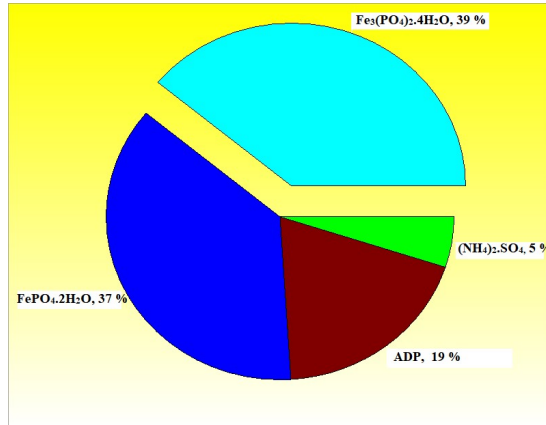
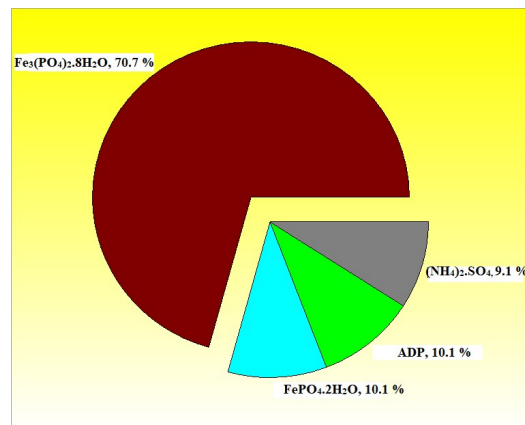


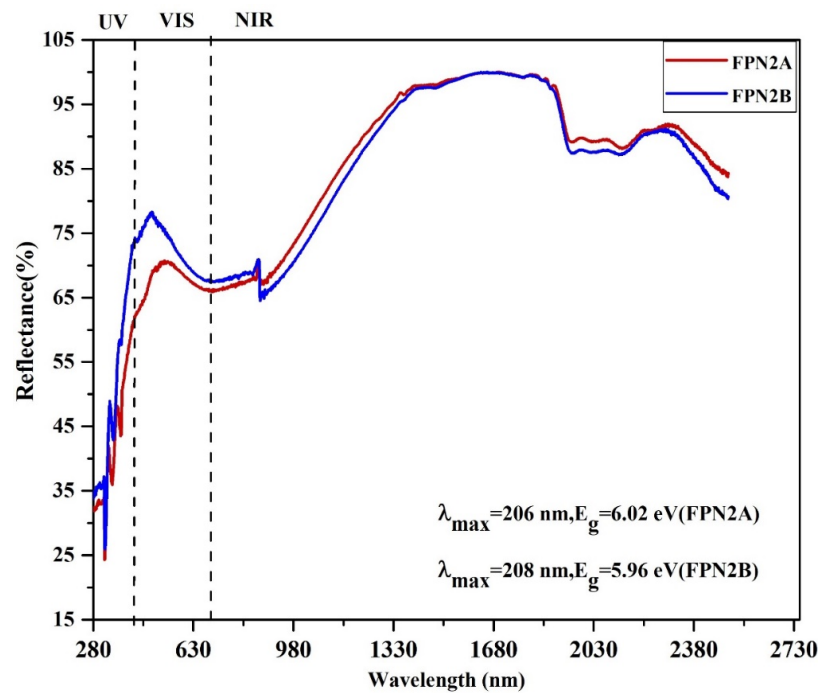
Fig.S2. Williamson-Hall plot of FPN2B



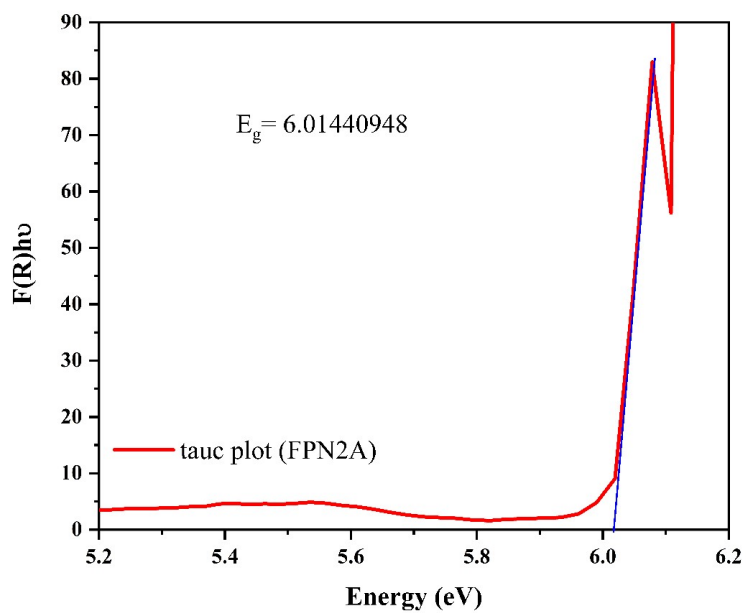
**Fig.S3.** Phase quantification of FPN2A



**Fig.S4.** Phase quantification of FPN2B



**Fig. S5.** UV-VIS-NIR Spectra of FPN2A and FPN2B



**Fig. S6.** Tauc plot of FPN2A

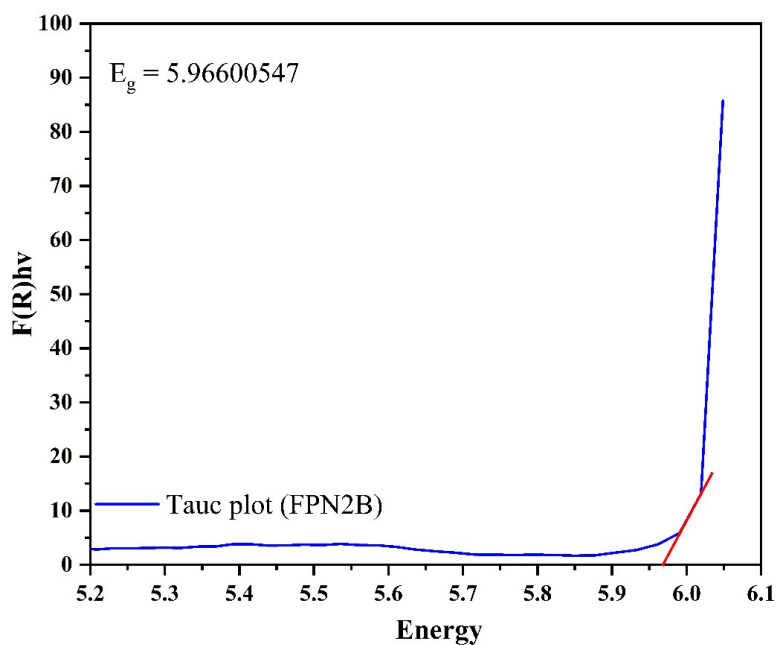


Fig. S7. Tauc plot of FPN2B

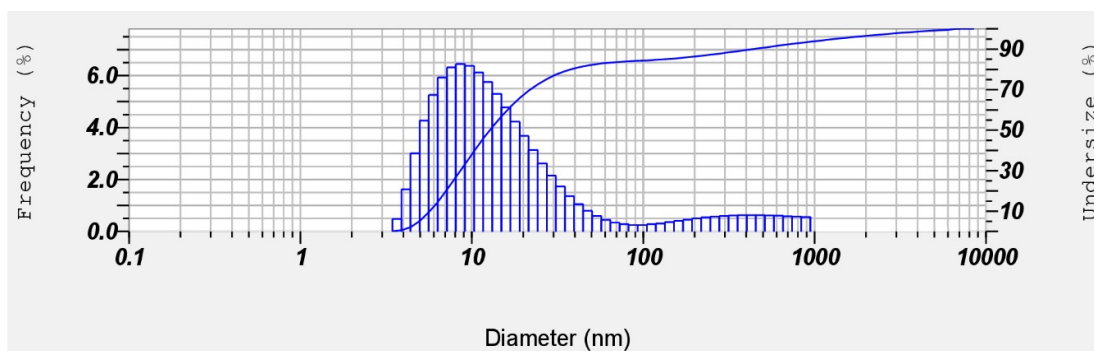
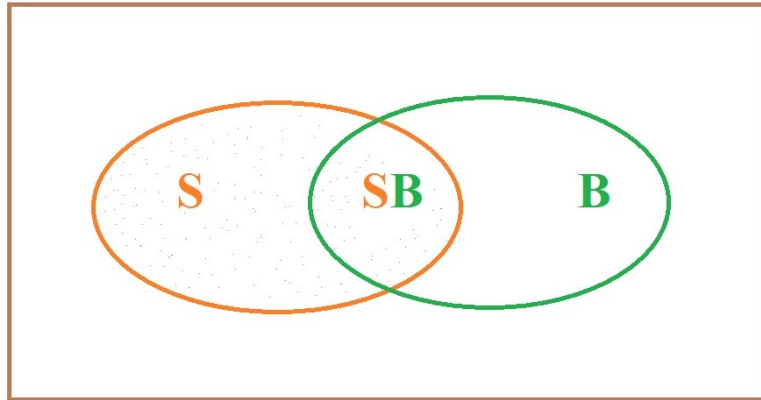


Fig.S8. Particle size distribution of FPN2C



**Fig.S9.** System and heat bath