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Electronic Supplementary Information

1. Characterization of $NiFe_2O_4$ phase

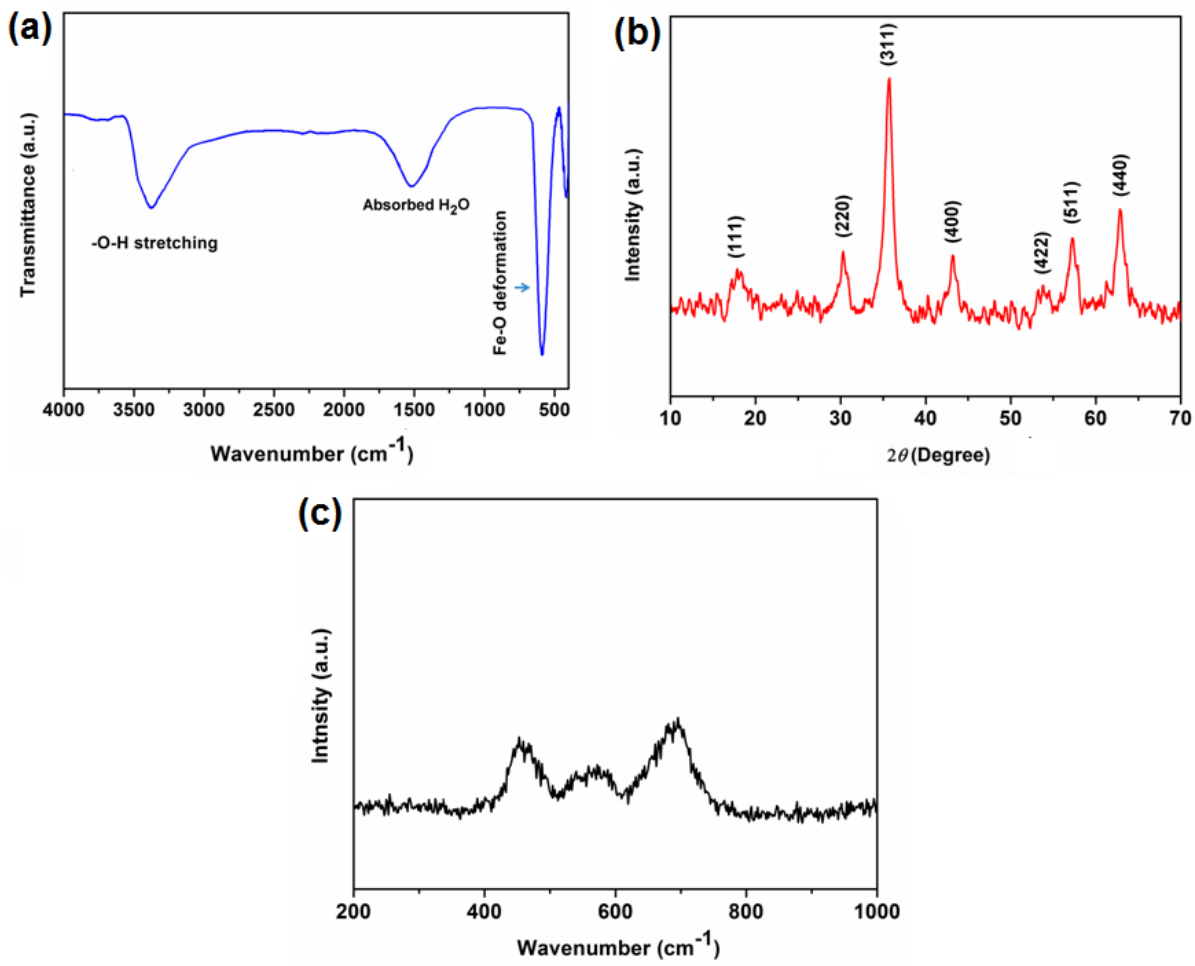

Figure S1 a. FTIR spectrum, b. XRD pattern and c. Raman spectrum of $NiFe_2O_4$ phase.

2. Thermal Properties

Table S1: Characteristics thermal temperatures for $NiFe_2O_4$@rGO/WPU nanocomposite

Code	On set degradation (T_{On}) (°C)	End set degradation (T_{End}) (°C)	Char residue (%)	Glass transition (T_g) (°C)	Melting point (T_m) (°C)
WPU	280	465	2.8	-20.2	36.2
PNC0.5	296	476	5.1	-17.4	37.7
PNC1.0	313	480	5.3	-15.1	38.1
PNC1.5	322	487	8.8	-13.2	39.1
PNC2.0	335	490	10.1	-12.3	39.6

3. Shape memory behavior

Table S2: Variation of temperature of $NiFe_2O_4$@rGO/WPU nanocomposite with time under sunlight irradiation

Code	Time (s)	Temperature (°C)	Shape recovery (%)
PNC0.5	135	43.3	93.2
	120	39.4	
	90	37.3	
	60	33.2	
	30	33.1	
	0	30.0	
PNC1.0	110	44.1	93.5
	90	40.7	
	60	37.9	
	30	34.4	
	0	30.0	
PNC1.5	95	44.6	94.2
	90	41.9	
	60	38.1	
	30	34.9	
	0	30.0	
PNC2.0	74	44.4	95.3
	60	41.8	
	30	35.7	
	0	30.0	