**Supplementary Information**

**Highly Efficient PANI-WH Novel Composite for Remediation of Ni(II), Pb(II) and Cu(II) from Wastewater**



SI Fig. 1 The image (a) is FT-IR Spectra of Wheat husk, Polyaniline, and composite (Wheat husk and polyaniline). (b) FT-IR Spectra of Composite before and after the adsorption of metals under study.



SI Fig. 2 The Zeta potential of the Polyaniline wheat husk at different pH values.

SI Table 1 FTIR peaks of Wheat Husk

|  |  |
| --- | --- |
| **Peak Frequency** **(cm-1)** | **Group assignment** |
| **1726** | C=O Stretching of acetyl and uronic ester group of hemicelluloses |
| **1640** | Amid band, representing 80% of C=O stretching of amide group coupled to in plane NH bending and C-N stretching modes |
| **1631** | H-OH bonding vibration |
| **1450-1370** | C-H symmetric and asymmetric deformations |
| **1032** | O-Si-O band |
| **920** | Si-OH stretching vibrations |
| **900** | Β-glycosidic linkage |

SI Table 2 FTIR peaks of Polyaniline

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency (cm-1)** | **Assignments** | **Frequency (cm-1)** | **Assignments** |
| 3460 | NH2 Asymmetric stretching | 1240 | C-N stretching in benzenoid unit |
| 3380 | NH2 Symmetric stretching, NH stretching | 1160 | Mode of N=quinoid unit=N |
| 3310 | H bonded NH stretching | 1140 | Mode of quinoid unit=NH-benzenoid unit |
| 3170 | =NH stretching | 1220,1010, 1105 | C-H in plane on 1,4 ring |
| 1587 | N=quinoid unit=N stretching | 1115,1060, 960 | C-H in plane of 1,2,4 ring |
| 1510 | N-benzenoid unit-N stretching | 910, 895, 850 | C-H out of plane on 1,2,4 ring |
| 1450 | Benzene ring stretching | 830, 740, 690 | C-H out of plane 1,4 ring |
| 1380 | C-N stretching in quinoid- trans benzenoid unit-quinoid unit | 645, 530, 500 | Aromatic ring deformations |