Supplementary Materials

Table 1. The maximum permissible contaminant level MCL standards for the most hazardous heavy metals (Modified from [1,2].

Sr. No	Elements	Permissible limits (mg/L)	Associated health hazards
1	Arsenic	0.050	Skin manifestations, visceral cancers, vascular disease
2	Cadmium	0.01	Kidney damage, renal disorder, human carcinogen
3	Chromium	0.05	Headache, diarrhea, nausea, vomiting, carcinogenic
4	Copper	0.25	Liver damage, Wilson disease, insomnia
5	Lead	0.006	Damage the fetal brain, diseases of the kidneys, circulatory system, and nervous system
6	Mercury	0.00003	Rheumatoid arthritis, and diseases of the kidneys, circulatory system, and nervous system
7	Nickel	0.20	Dermatitis, nausea, chronic asthma, coughing, human carcinogen
8	Zinc	0.80	Depression, lethargy, neurological signs and increased thirst

Table 2. Adsorption capacities of some agricultural and biological wastes for heavy metals.

Adsorbent	Adsorption capacity (mg/g)						References
	Pb^{2+}	Cd^{2+}	Zn^{2+}	Cu^{2+}	Cr^{2+}	Ni^{2+}	
Maize cope and husk	456	493.7	495.9	NR	NR	NR	[3]
Orange peel	NR	NR	NR	NR	NR	158	[4]
Coconut shell charcoal	NR	NR	NR	NR	3.65	NR	[5]
Pecan shells activated carbon	NR	NR	13.9	31.7	NR	NR	[6]
Rice husk	NR	2.0	NR	NR	0.79	NR	[7]
Modified rice hull	NR	NR	NR	NR	23.4	NR	[8]
Spirogyra (green alga)	NR	NR	NR	133	NR	NR	[9]
Ecklonia maxima—marine alga	235	NR	NR	90	NR	NR	[10]
Ulva lactuca		NR	NR	NR	112.3	NR	[11]
Oedogonium species	145	NR	NR	NR	NR	NR	[12]
Nostoc species	93.5	NR	NR	NR	NR	NR	[12]
Bacillus—bacterial biomass	467	85.3	418	381	39.9	NR	[13]

NR: Not reported.

Table 3. Efficiency of different nano-adsorbents for the removal of heavy metals from wastewater.

Nano-adsorbent	Contaminants	Experimental conditions			% Removal efficacy	Reference
		Adsorbent dose (g/L)	pH	Contact time (min)		
Magnetic zeolite-polymer composite	**Cr(V)**	**0.15**	4–5	1440	73	[14]
Modified magnetite nanocomposite	Cu(II)	0.19	6.5	15	99	[15]
Magnetic nano-adsorbent	Zn(II)	2.5	5.5	90	95	[16]
Magnetic multi-wall carbon nanotubes	Cr(VI)	0.1	3	600	100	[17]
Zinc sulfide nanocrystals	Hg(II)	10	1-6	5	99.99	[18]
Nanocrystalline titanium dioxide	As(III)	0.2	9.5	-	>98	[19]
Magnetic nano-particles coated zeolite	As(III)	0.5	2.5	15	95.6	[20]
Magnetic nano-adsorbent	Pb(II)	20	6	10	80	[21]

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