Supplementary information

for

Systematic Synthesis of Pectin-*g*-(Sodium Acrylate-*co*-N-Isopropylacrylamide) Interpenetrating Polymer Network for Mere/Synergistic Superadsorption of Dyes/M(II): Comprehensive Determination of Physicochemical Changes in Loaded Hydrogels

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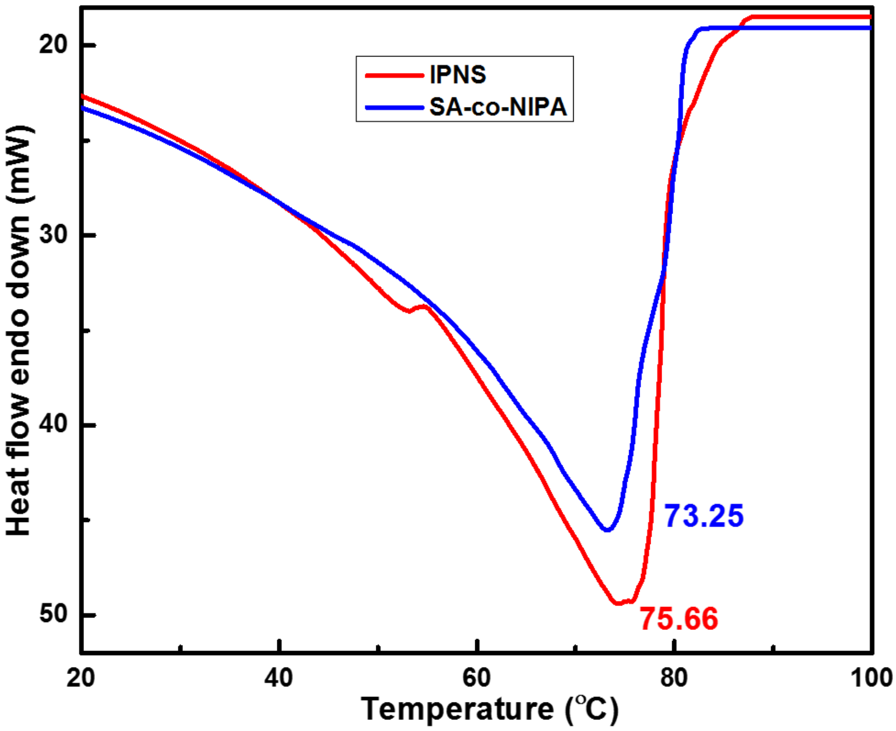

Figure S1. LCST of SA-*co*-NIPA and IPNS hydrogels

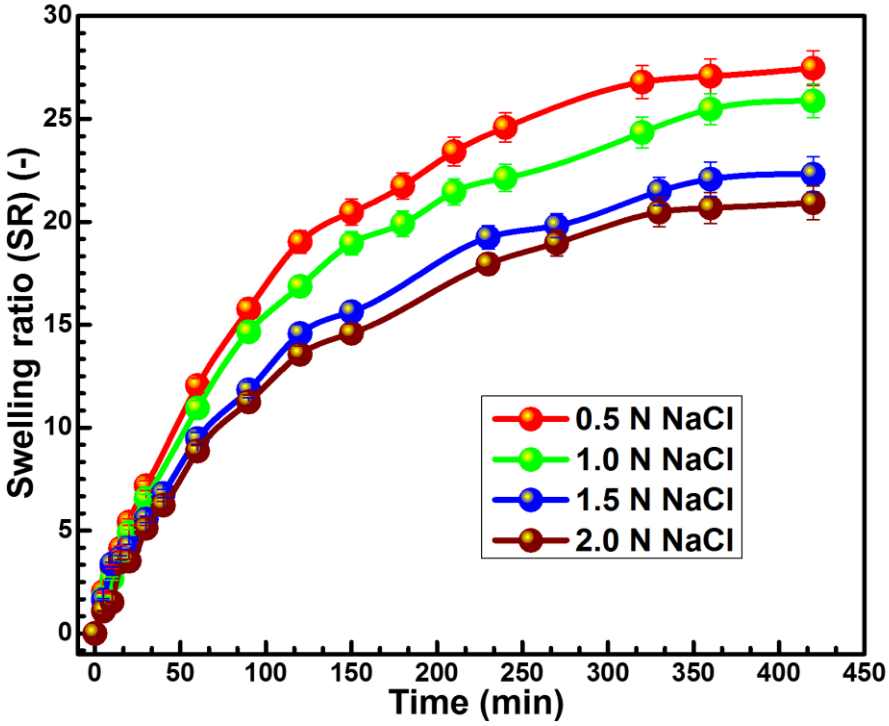

Fig. S2 ESR of IPNS in various ionic strengths of solutions

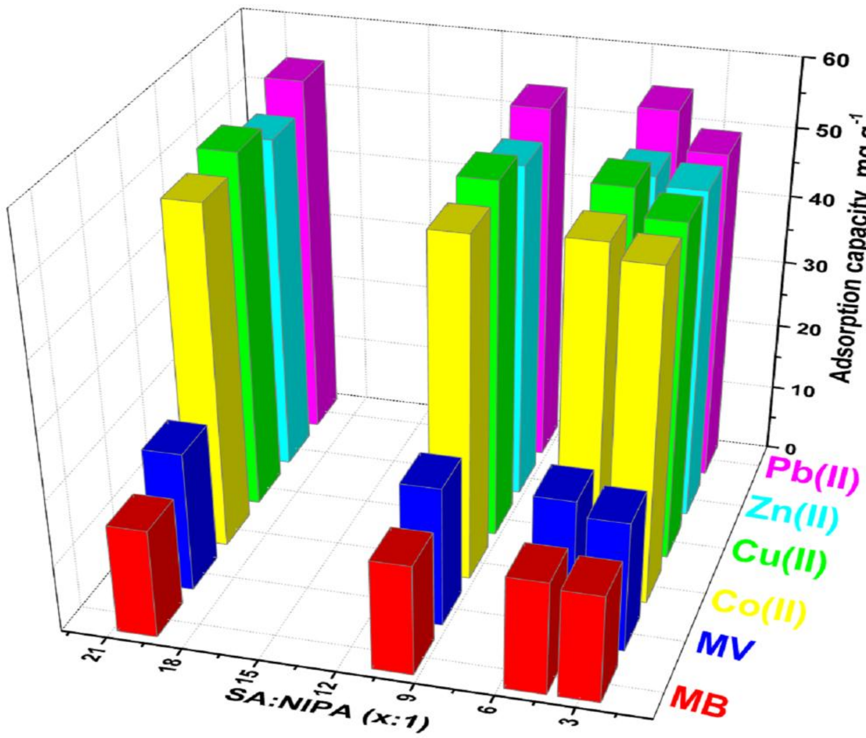

Fig. S3 Variation of ACs, of dyes and M(II), with different IPNs

Comparison of the results obtained from literature

Several adsorbents, including natural, semi-synthetic, synthetic and waste materials have already been attempted for adsorptive waste remediation of MB, MV, Co(II), Cu(II), Zn(II) and Pb(II) at varying feed concentrations (2–1000 ppm), temperature (278–323 K) and pH (7.0–11.0 and 1.0–7.0 for dyes and M(II), respectively). However, ACs obtained in the present study were relatively higher than most of the reported results in literature (Table S1).

Table S1. Comparison table

Dyes/M(II)	Name of the adsorbents	Adsorption capacities (mg g^{-1}) /pH/C_0 (mg L^{-1})/temperature (K)	Ref.
MV	h-XG/SiO_2[a]	378.80/9.0/350/313	S1
	N-benzyltriazole derivatized dextran	95.24/4.0/12.5–50/288	S2
	MSWI bottom ash[b]	19.58/8.0/24.4/303	S3
	AS[c]	76.34/8.0/100-1000/278	S4
	Semi-IPN of starch and copolymer of AM[d] and HEMA[e]	2.47/7.0/2.5/303	S5
	Soya ash	5.76/9.0/25/303	S6
	CPSA4[f]	2.09/7.0/2/298	S7
	poly(AM-*co*-AA)[g]	6.38/7.0/50/298	S8
	Poly(VP-*co*-MA)[h]	4.22/7.0/500/298	S9
	IPNS[i]	265.49/10.0/200–300/303	PS^
	IPNS[i]	21.68/10.0/5–30/303	PS^
MB	h-XG/SiO_2[a]	497.50/8.0/400/323	S1
	Br/Mo heterostructures	54.82/4.0/30–70/–	S10
	MIL-53(A1)-NH_2[j]	45.20/7.0/5/–	S11
	MCGO[k]	70.03/1.5–12.0/70/298	S12
	PNIPAAm[l]	8.50/6.5–6.7/10–50/298	S13
	PNIPAAm/IA[m]	17.52/6.5–6.7/10–50/298	S13
	PNIPAAm/IA/pumice	22.18/6.5–6.7/10–50/298	S13
	BC-PM[n] microparticles	25/6.5/500/298	S14
	Cu-BTC[o]	15.28*/7.0/1–10#/298	S15
	IPNS[i]	137.43/11.0/200–300/303	PS^
	IPNS[i]	16.97/11.0/5–30/303	PS^
Co(II)	NiO	10.38/8.5/5–50/303	S16
	Phosphate-immobilized Zr-pillared bentonite	47.81/6.0/5/–	S17
	PoP400[p]	373/6.0/10–1000/298	S18
	PoP600[q]	405/6.0/10–1000/298	S18
	IPNS[i]	51.72/7.0/5–30/303	PS^
Cu(II)	P(NIPAM-MA-VI)[r]	21.10/5.0/–/333	S19
	Bare Malachite Nanoparticle	3.20/5.0–6.0/10–100/–	S20
	Lemon peel	70.92/5.0/100–300/301	S21
	Cu(II)-imprinted poly(methacrylic acid/vinyl pyridine) polymer	22.40/7.0/2.5–70/298	S22
	Fe_3O_4@SiO_2-Cu(II)-imprinted polymer	24.20/7.0/80/298	S23
	Cu(II)-imprinted poly(chitosan/attapulgite)	35.20/1.0–6.0/40/298	S24
	Cu(II) ion-imprinted poly(methacrylic acid/vinyl pyridine) micro-particles	15.04/6.2/10/–	S25
	Copper-imprinted polymethacrylate porous beads	2.00/6.5/5–100/298	S26
	IPNS[i]	53.86/7.0/5–30/303	PS^
Zn(II)	Serbian natural clinoptilolite	12.00/–/600/298	S27
	Composite E20 bentonite	29.67/5.0/10–750/293	S28
	Bare Malachite Nanoparticle	3.30/5.0–6.0/10–100/–	S20
	Bagasse Fly Ash	7.03/6.0/10–100/303	S29
	Lemon peel	27.86/5.0/100–300/301	S21
	IPNS[i]	50.46/7.0/5–30/303	PS^
Pb(II)	APAN[s]	60.6/4.0/40–1000/303	S30
	Bare Malachite Nanoparticle	7.2/5.0–6.0/10–100/–	S20
	Lemon peel	37.87/5.0/100–300/301	S21
	Jordanian kaolinite	13.32/5.0/50–400/295	S31
	Kaolinite	11.50/5.7/10–50/303	S32
	Montmorillonite	31.10/5.7/10–50/303	S32
	IPNS[i]	54.86/7.0/5–30/303	PS^

[a]Hydrolyzed polyacrylamide grafted xanthan gum and its nanosilica composite, [b]municipal solid waste incinerator, [c]almond shell, [d]acrylamide, [e]hydroxyethyl methacrylate, [f]IPN of poly(acrylic acid-*co*-acrylamide) and sodium alginate, [g]poly(acrylic acid-*co*-acrylamide), [h]poly(N-vinylpyrrolidone-*co*-methacrylic acid), [i]metal-organic framework, [j]interpenetrating network superadsorbent, [k]magnetic cellulose/graphene oxide composite, [l]poly(N-isopropylacrylamide) hydrogel, [m]poly (N-isopropylacrylamide)/itaconic acid composite hydrogel, [n]biochar microparticles derived from pig manure, [o]metal-organic framework (MOF) based on copper-benzenetricarboxylate,

[p]activated carbons produced by pyrolysis of waste potato peels at 400 °C, [q]activated carbons produced by pyrolysis of waste potato peels activated at 600 °C, [r]poly(N-isopropylacrylamide-*co*-maleic acid-*co*-1-vinylimidazole), [s]aminated polyacrylonitrile, [#]μ mol L^{-1}, [*]μ mol g^{-1} and [^]present study.

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