Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A
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ELECTRONIC SUPPLEMENTARY INFORMATION

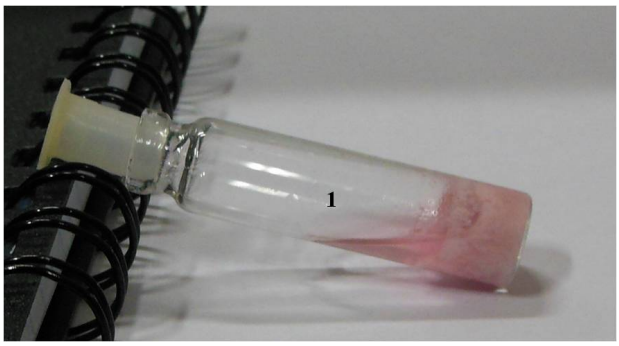

Figure S1. Digital image of gelatinous precipitate obtained using $CoCl_2$ as crosslinking agent. Tag on vial show the coordination ratio (metal ion-to-4VP). The photograph was taken after 24 hours of metal ion addition.

Figure S2. Snapshots of $NiCl_2$ crosslinked polymeric systems. Tags on vials represent coordination ratio. The photographs were taken 24 h after addition of metal ion.

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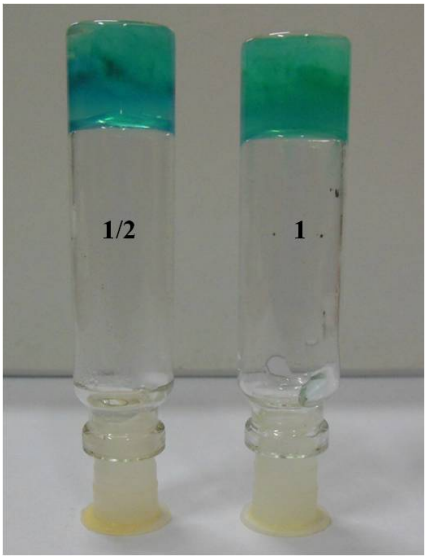

Figure S3. Snapshots of heterogeneous gels obtained when $CuCl_2$ was used as crosslinking agent. Tags on vials indicate the coordination ratio of metal ion to repeating unit of polymer. The photographs were taken after 24 hours of metal ion addition.

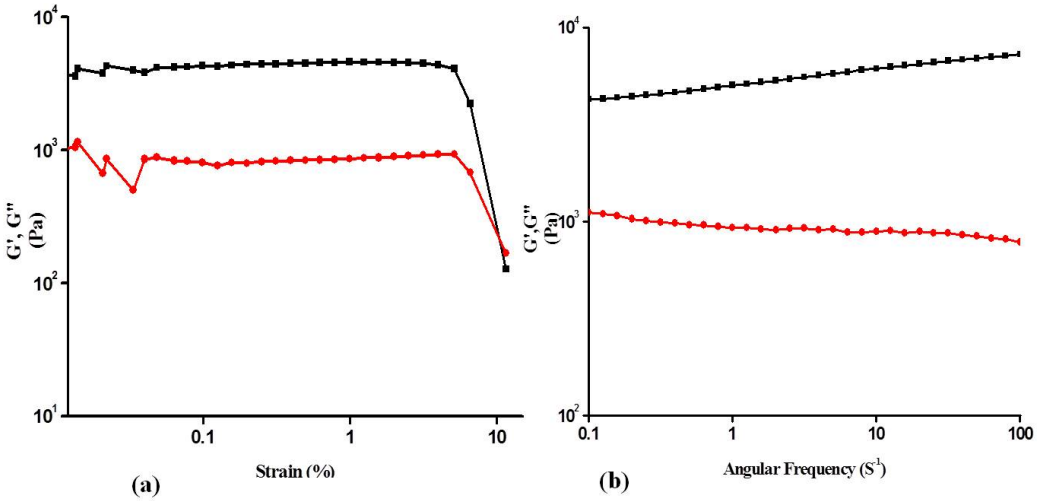

Figure S4. (a) Amplitude sweep test, and (b) Frequency sweep test of the **NiP** gel. Variation of storage (black) and loss (red) moduli with amplitude and frequency, respectively. Note that in amplitude sweep test the value of G′ is about five times than the value of G″ which shows solid-like nature of the **NiP** gel.

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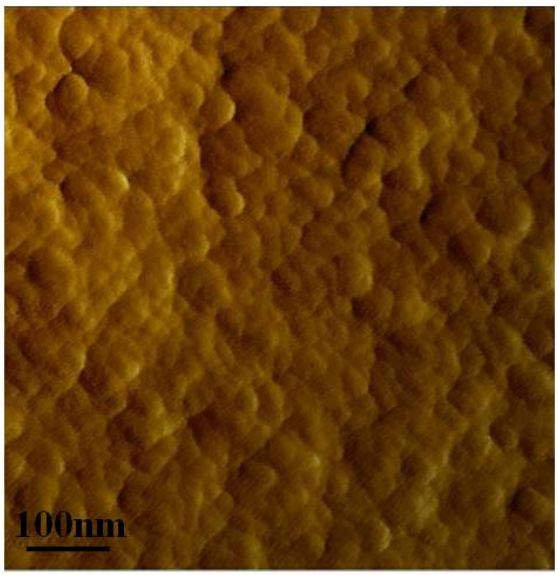

Figure S5. AFM micrograph of **NiP** gel obtained in amplitude mode depicting the globular morphology on nanometer scale.

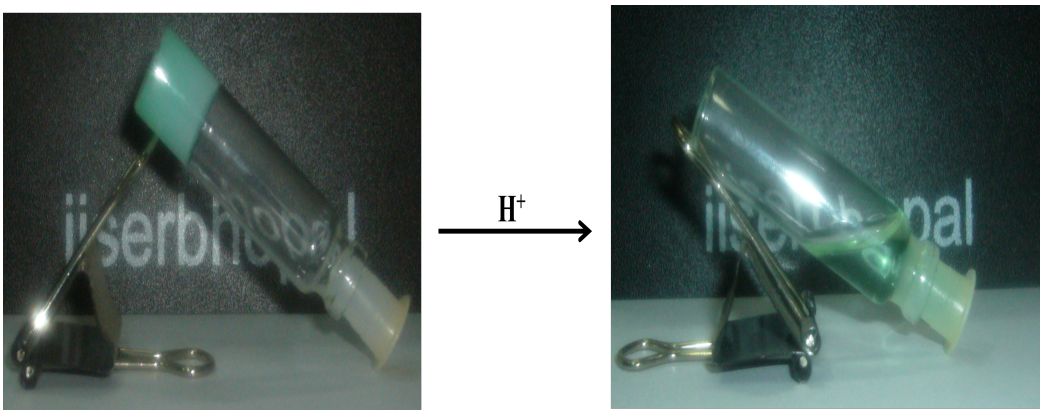

Figure S6. Illustration of pH-sensitive nature of **NiP** gel. A quick gel-to-sol conversion was seen upon acidification of the gels.

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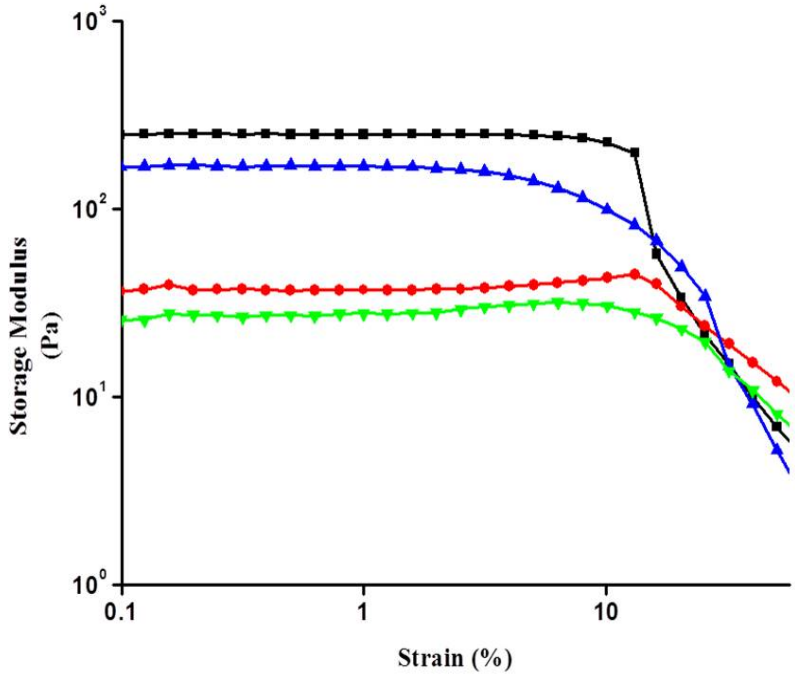

Figure S7. Amplitude sweep test showing the self-healing nature of gels prepared in DMSO. Variation of G′ (black) and G″ (red) of the pristine gel and variation of G′ (blue) and G″ (green) of the regenerated gel after keeping undisturbed for 15 h.

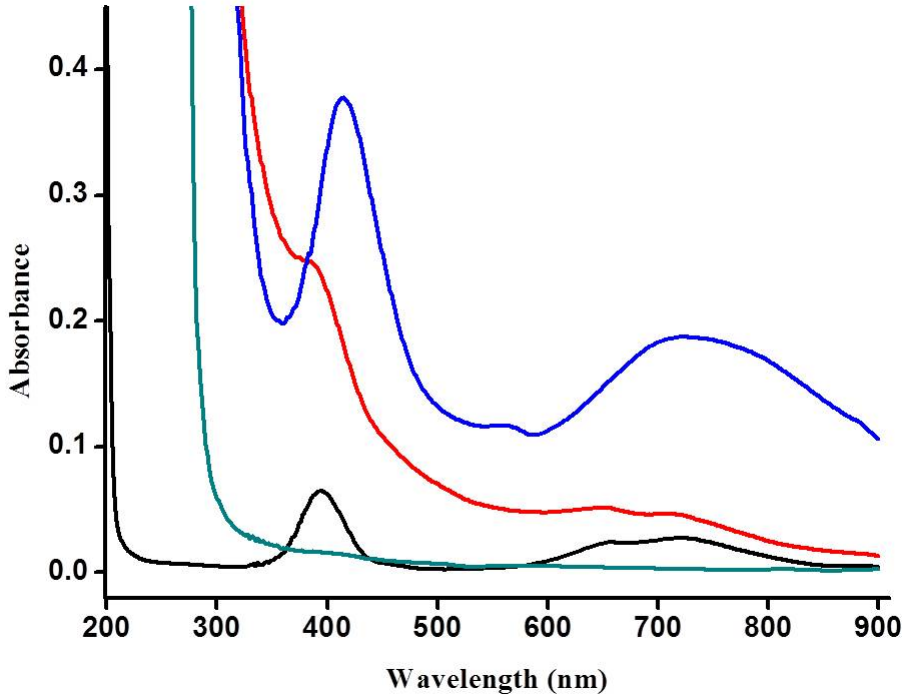

Figure S8. UV-visible spectra of P4VP (cyan) in H_2O-MeOH mixture, aqueous Ni(II) (black), polymer-metal complex (red) in H_2O-MeOH mixture and **NiPF** film (blue).

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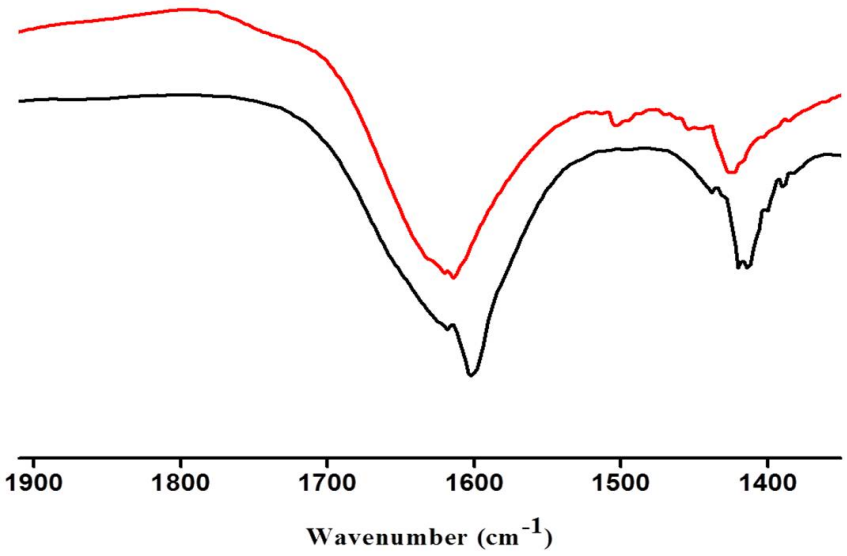

Figure S9. FTIR spectra of P4VP (black) and **NiPF** film (red) showing a blue shift in the band around 1600 cm^{-1} due to coordination of Ni^{2+} ions by N-atom on pyridine moiety.

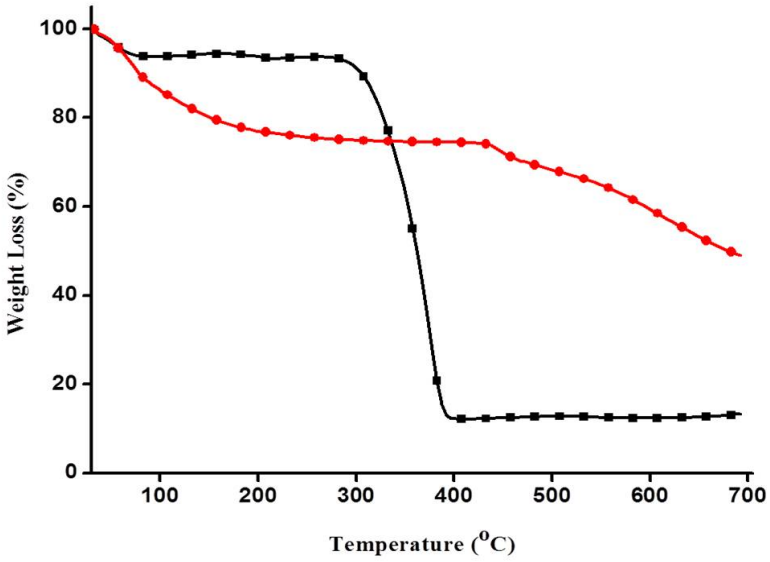

Figure S10. Thermogravimetric curve of P4VP (black curve) and **NiPF** film (red curve). The first weight loss corresponds evaporation of entrapped solvents. The polymer starts degrading beyond 300 °C when uncomplexed while after complexation to Ni(II), its thermal stability is enhanced.

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Table S1 Complex formation with transition metal chlorides other than $NiCl_2$

MCl_2	**M(II):4VP**	**Inference**
$CoCl_2$	1:2	gp
	1:1	gp
$CuCl_2$	1:2	htg
	1:1	htg
$ZnCl_2$	1:2	p
	1:1	p

gp : gelatinous precipitate, htg : heterogeneous gel, p : precipitate