Chirality Sensing using Ag^{+}-Thiol Coordination Polymers

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Electronic Supplementary Information (ESI)

<u>Fugures S1 – S6</u>

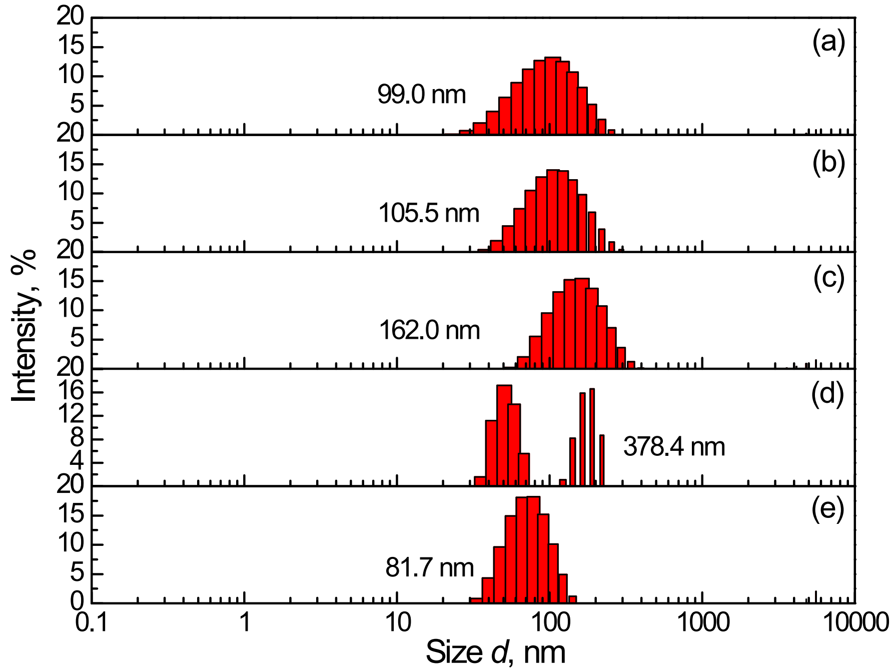


Figure S1 Size of Ag^{+}-MPBA coordination polymers in the absence (a) and presence of D-glucose (b), D-mannose (c), D-fructose (d) and D-galactose (e) in pH 10.0 carbonate buffer containing 50% by volume methanol. [MPBA] = [Ag^{+}] = 0.1 mM, [D-saccharide] = 1.0 mM.

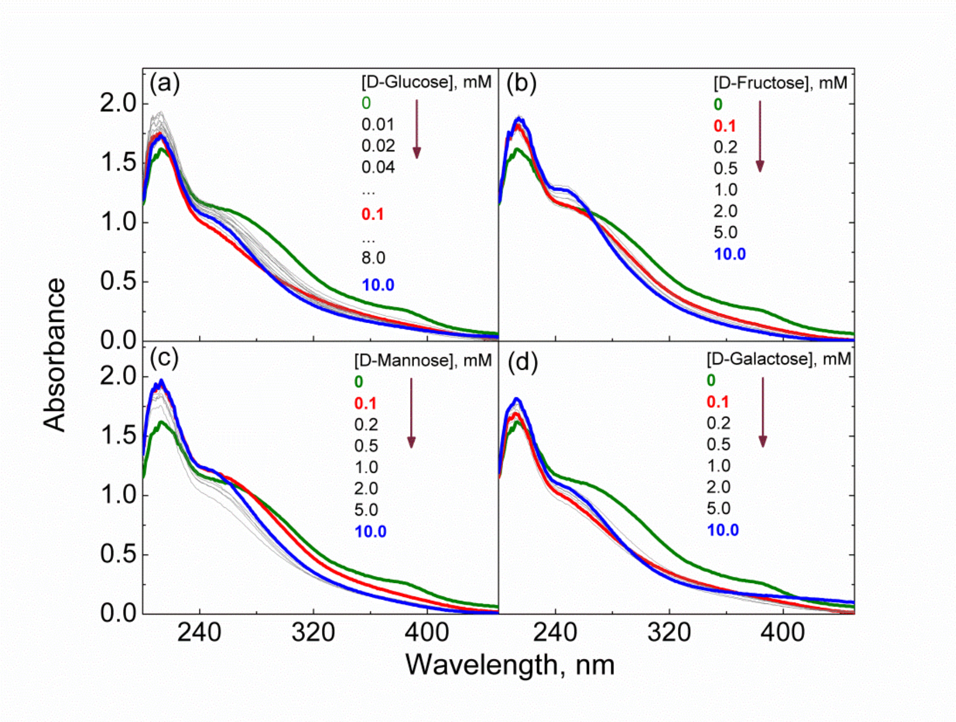
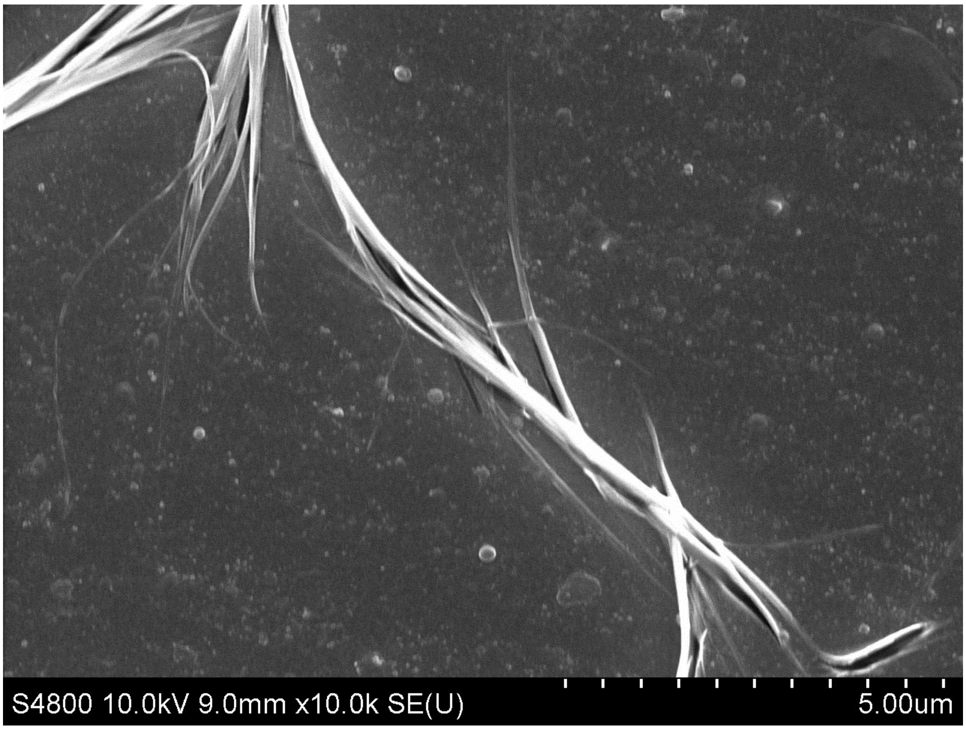
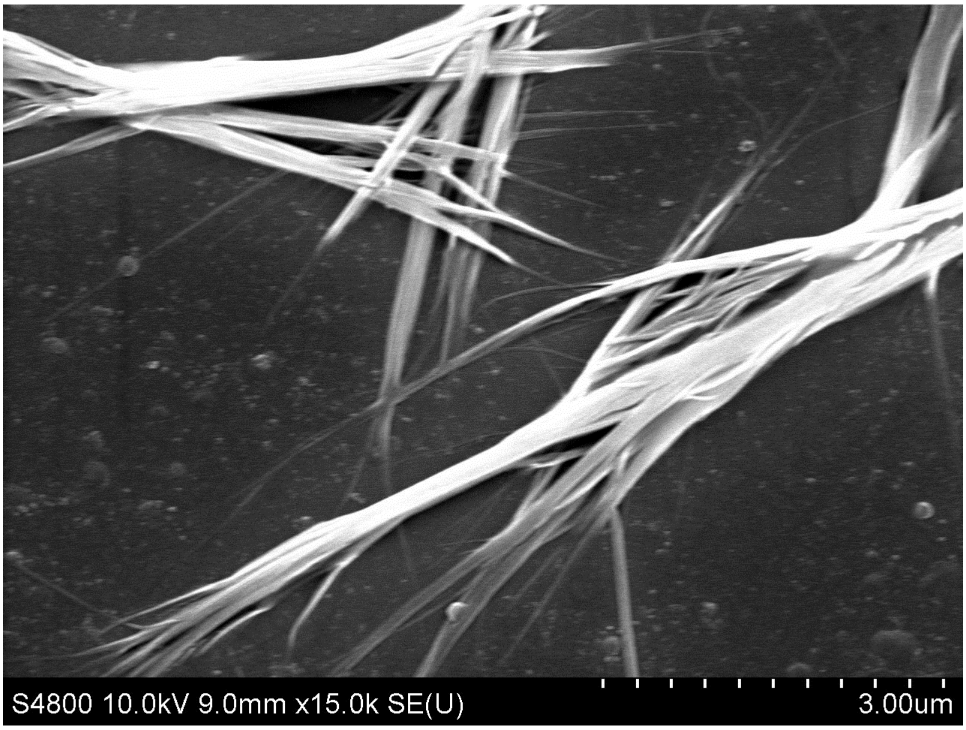


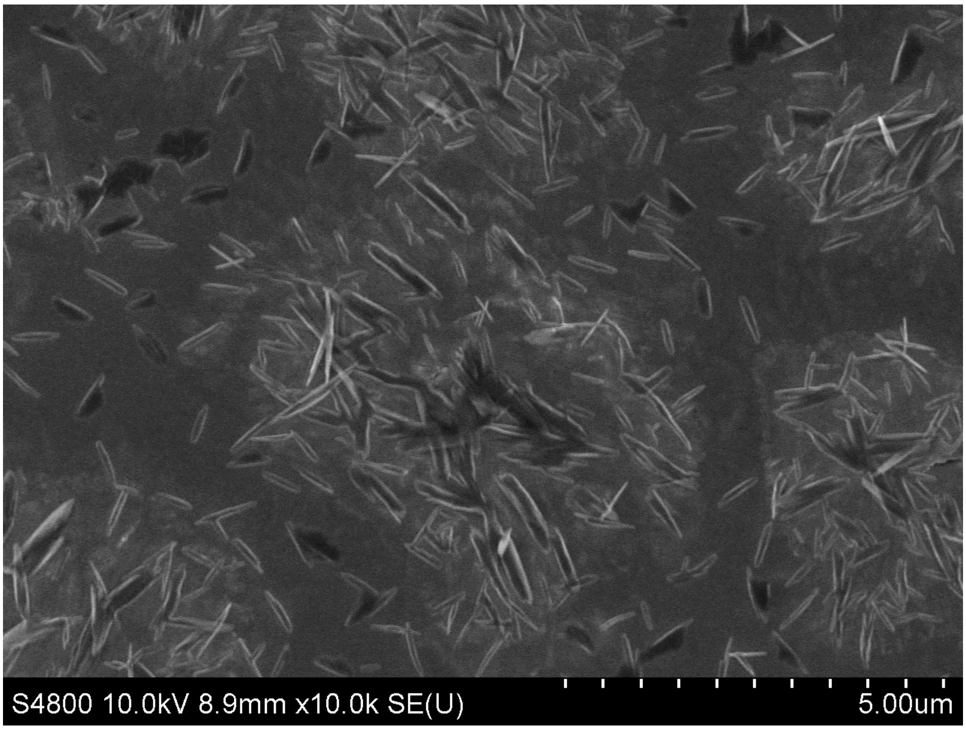
Figure S2 Absorption spectra of Ag^{+}-MPBA coordination polymers in the presence of D-saccharides of increasing concentration in pH 10.0 carbonate buffer containing 50% (v/v) methanol. [MPBA] = [Ag^{+}] = 0.1 mM.

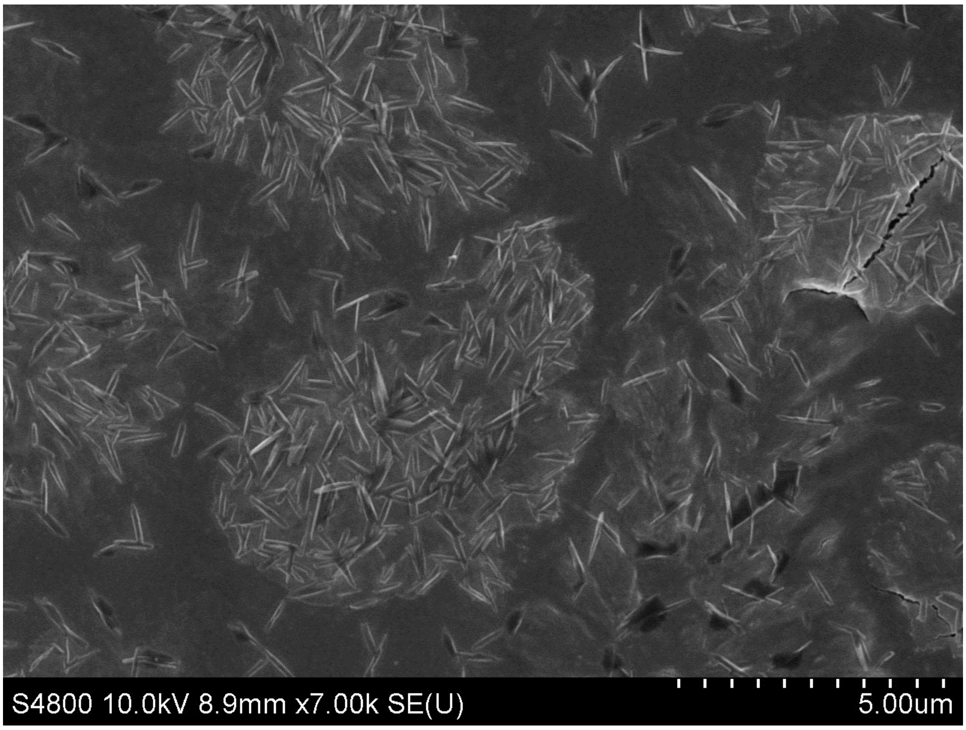
(a) Ag^+ + MPBA



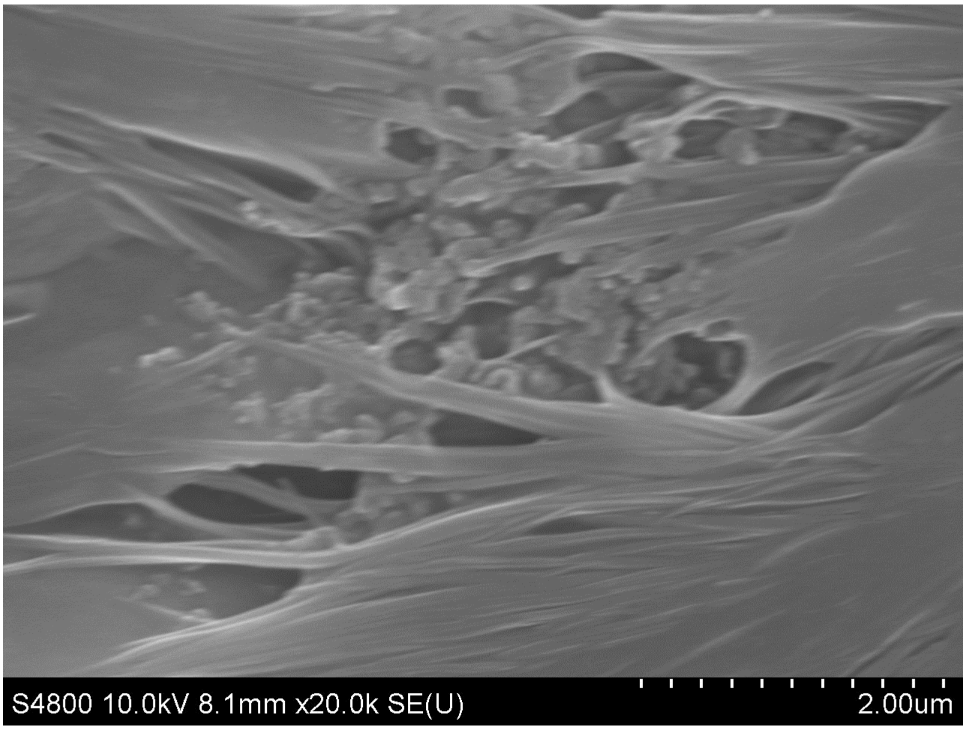


(b) D-Glucose + MPBA





(c) D-Glucose + Ag^+ + MPBA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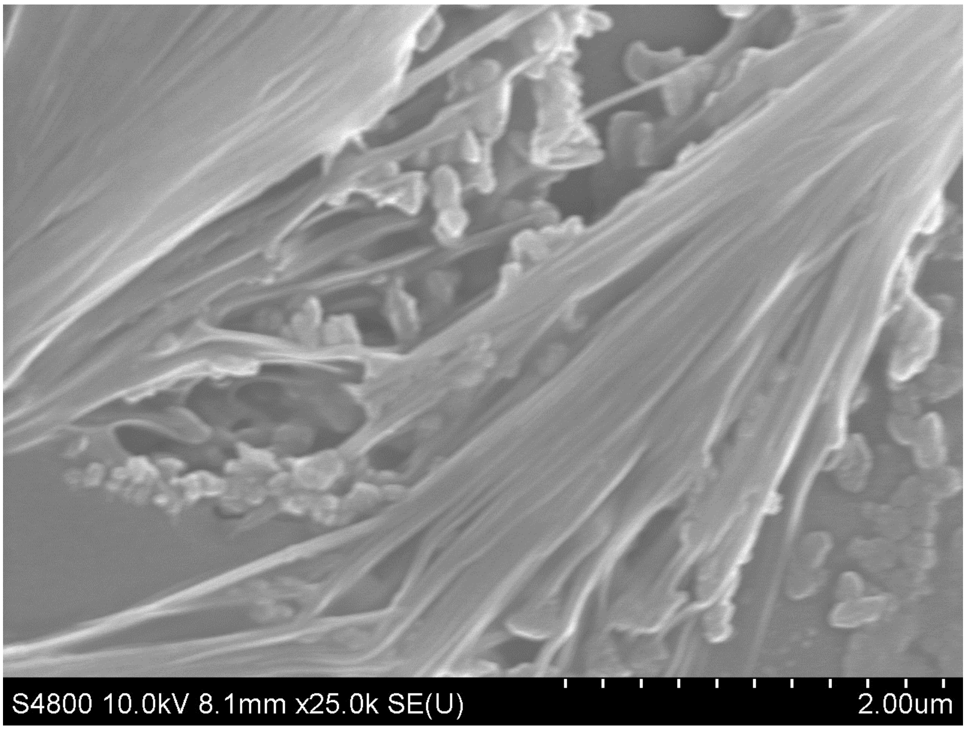
2.00um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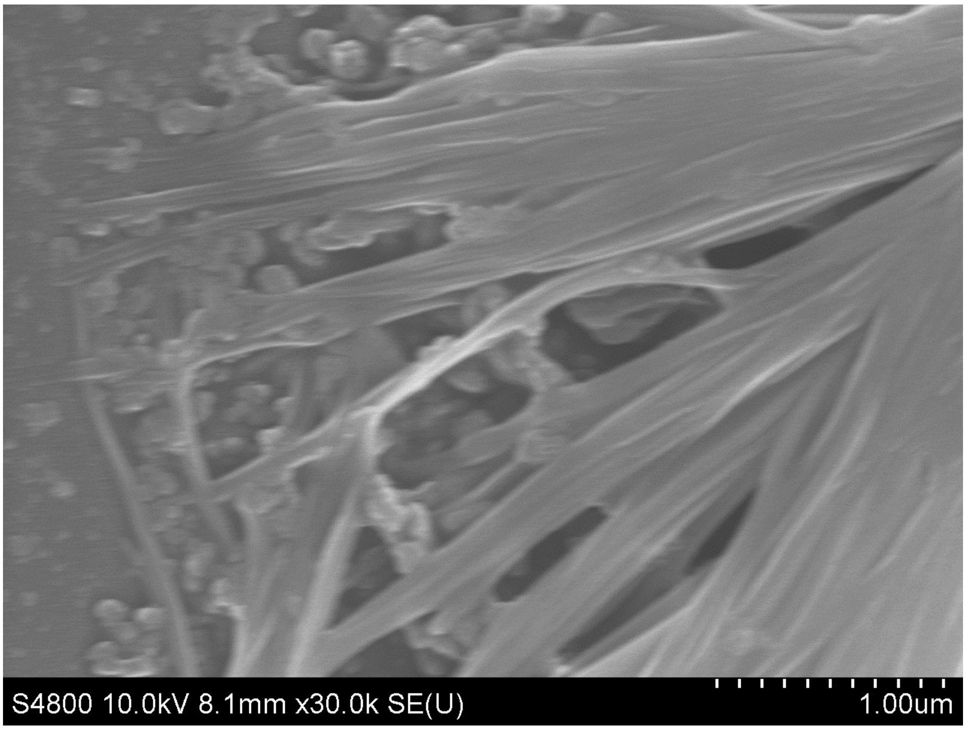

Figure S3 SEM images of samples prepared from (a) 1.0×10^{-5} M MPBA and 1 equivalent of Ag^{+}, (b) 1.0×10^{-5} M MPBA and 4.0×10^{-4} M D-glucose, and (c) 1.0×10^{-5} M MPBA plus 1 equivalent of Ag^{+} and 4.0×10^{-4} M D-glucose.

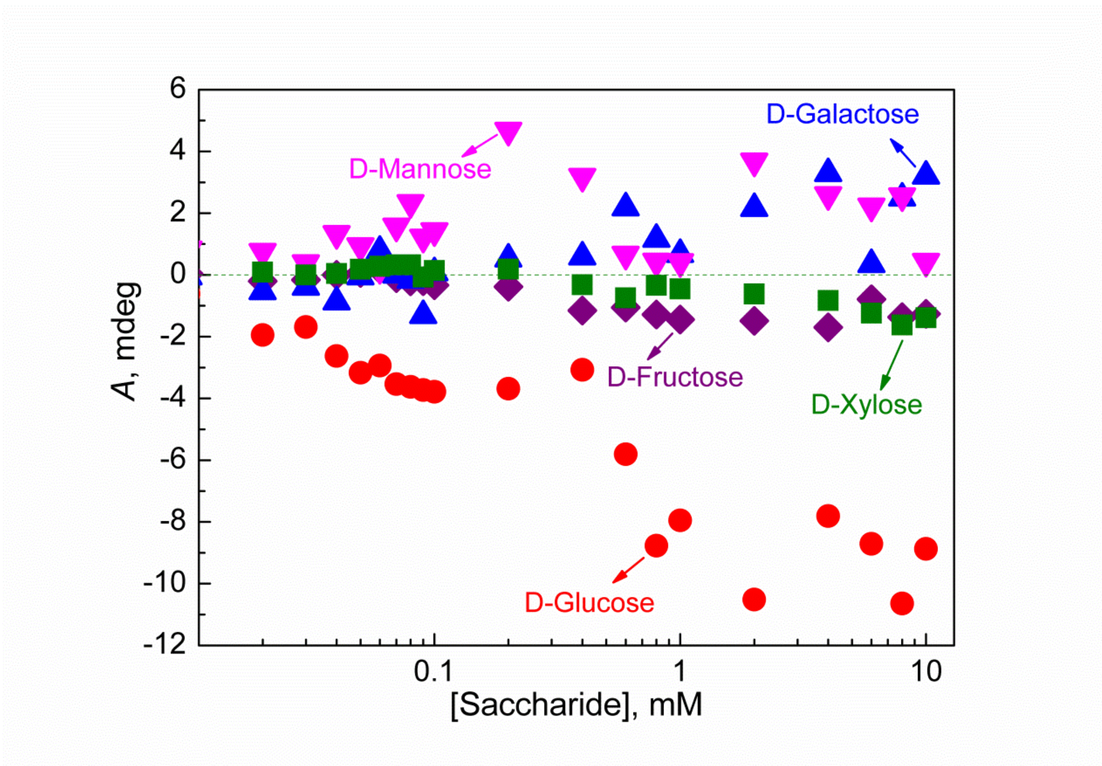

Figure S4 Plots of A-value of saccharide-Ag^{+}-MPBA supramolecular systems against saccharide concentration. The dependence is not only defined by the affinity of the individual saccharide towards boronic acid represented by phenylboronic acid (refer to J. P. Lorand, J. O. Edwards, *J. Org. Chem.*, 1959, **24**, 769-774), suggesting the contribution of the multivalent interactions to the observed CD spectral profile. Note an extremely sensitive CD response toward glucose at micromolar level can be noted, which is much more sensitive than that for fructose which has a much higher affinity towards monoboronic acid such as phenylboronic acid. The "*boronic acid*" in this coordination polymer thus acts as a compound containing multiple boronic acid groups. $A_{\text{D-glucose}} = \theta_{330\text{ nm}} - \theta_{280\text{ nm}}$, $A_{\text{D-fructose}} = \theta_{350\text{ nm}} - \theta_{270\text{ nm}}$, $A_{\text{D-mannose}} = \theta_{360\text{ nm}} - \theta_{300\text{ nm}}$, $A_{\text{D-galactose}} = \theta_{340\text{ nm}} - \theta_{284\text{ nm}}$, $A_{\text{D-xylose}} = \theta_{275\text{ nm}}$. [MPBA] = [$Ag^+$] = 5.0×10^{-5} M.

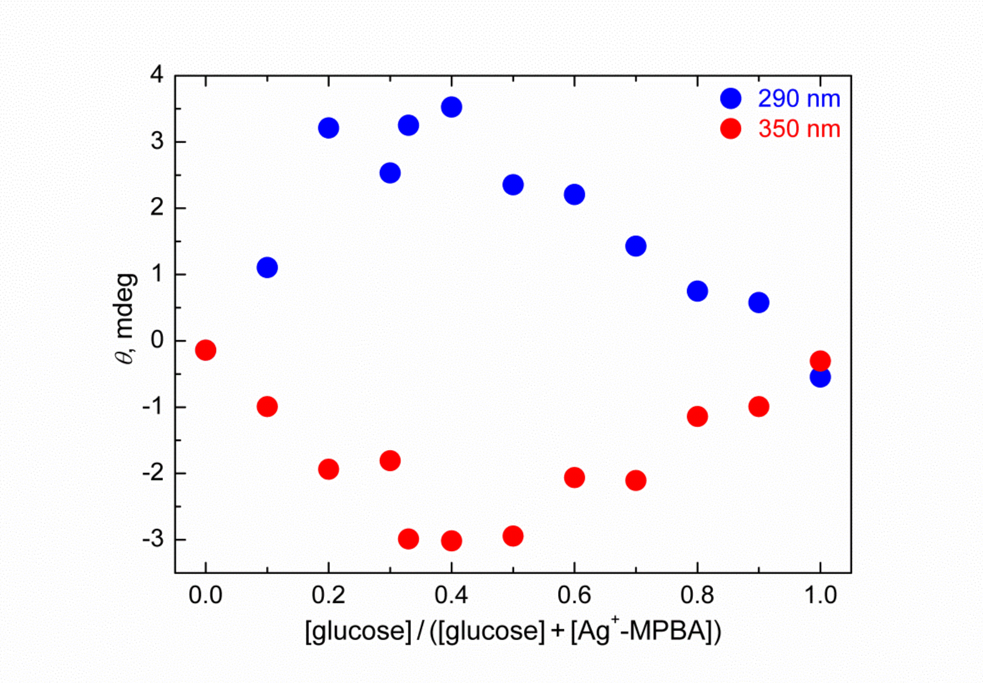

Figure S5 Job plot for binding of D-glucose to Ag^+-MPBA coordination polymers. Total concentration of Ag^+-MPBA and D-glucose is 1.0×10^{-4} M, while [Ag^+] is maintained the same as [MPBA].

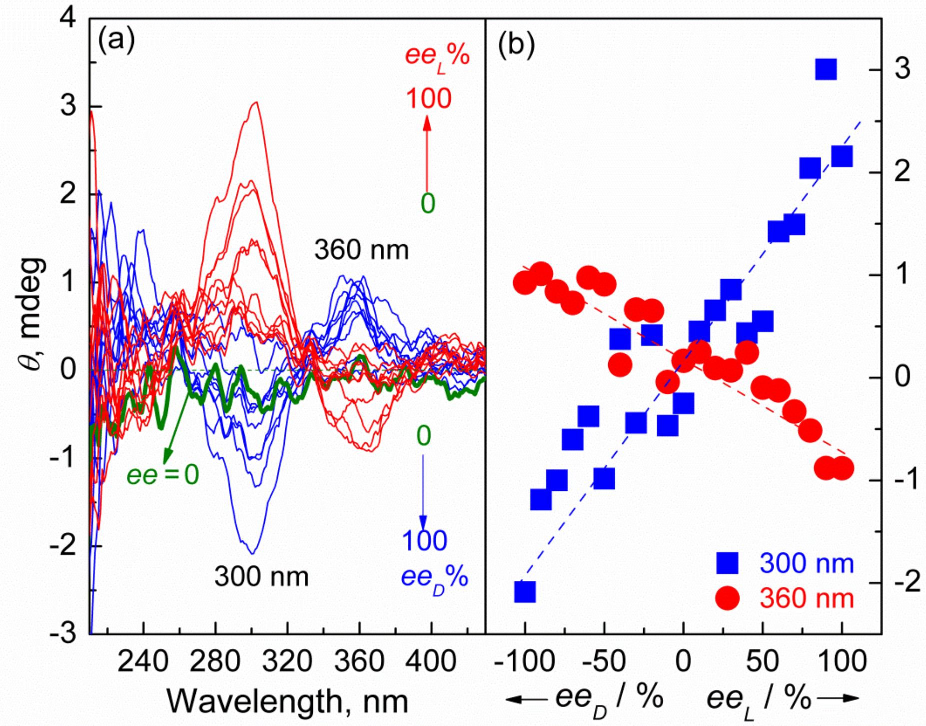

Figure S6 (a) CD spectra of Ag^{+}-MPBA coordination polymers in the presence of mannose of varying *ee* and (b) plots of CD signals at 300 nm and 360 nm as a function of *ee* of mannose. [Ag^{+}-MPBA] = 5.0×10^{-5} M, [D-mannose] + [L-mannose] = 2.0×10^{-3} M.