The selective and efficient capture of phosphopeptides is critical for comprehensive and in-depth phosphoproteome analysis. However, this remains a significant challenge due to the inherently low abundance of these species in complex bio-samples. In this paper, we report a switchable two-dimensional (2D) supramolecular polymer that can serve as an ideal platform for the enrichment of phosphopeptides. A positively charged metallacycle incorporated into the polymer endows the material with a high affinity for phosphopeptides. Importantly, the stimuli-responsive nature of the polymer facilitates switchable binding affinity of phosphopeptides, resulting in its excellent performance in phosphopeptide enrichment and separation from model proteins. The polymer has a high enrichment capacity (165 mg/g) and detection sensitivity (2 fmol), high enrichment recovery (88%), excellent specificity, and rapid enrichment and separation properties. Additionally, we have demonstrated the capture of phosphopeptides from the tryptic digest of real bio-samples illustrating the potential of this polymeric material in phosphoproteomic studies.
Other files

| File Name   | Size (MiB) | View on ChemRxiv | Download File |
|-------------|------------|------------------|---------------|
| PP-MS.pdf   | 6.29       | view on ChemRxiv | download file |
| PP-SI.pdf   | 30.27      | view on ChemRxiv | download file |