# Supporting Information

**Table S1** Adsorption capacity of adsorbents in this work compared to the other published similar adsorbents for Cr(VI) removal.

| Adsorbent | pH | Adsorption capacity ($mg \cdot g^{-1}$) | Reference |
|---|---|---|---|
| Maghemite nanoparticles | 2 | 19.20 | Hu et al. (2005) |
| Amino-modified $Fe_3O_4$ NPs | 2 | 11.24 | Huang and Chen (2009) |
| Fe/FeS | 5 | 69.70 | Gong et al. (2017) |
| Nano $Fe^0$ | 3 | 17.61 | Zhou et al. (2014) |
| Nano Ni/$Fe^0$ | 3 | 22.59 | Zhou et al. (2014) |
| FeS-900 | 2 | 81.62 | This study |

**Table S2** The quantitation of these peaks of FeS-900 before and after adsorption.

| Sample | Atomic ratio (%) | | | | |
|---|---|---|---|---|---|
| | C 1s | O 1s | S 2p | Fe 2p | Cr 2p |
| FeS-900 (before) | 76.69 | 19.74 | 1.79 | 1.78 | 0 |
| FeS-900 (after) | 67.48 | 27.30 | 1.47 | 1.19 | 2.56 |

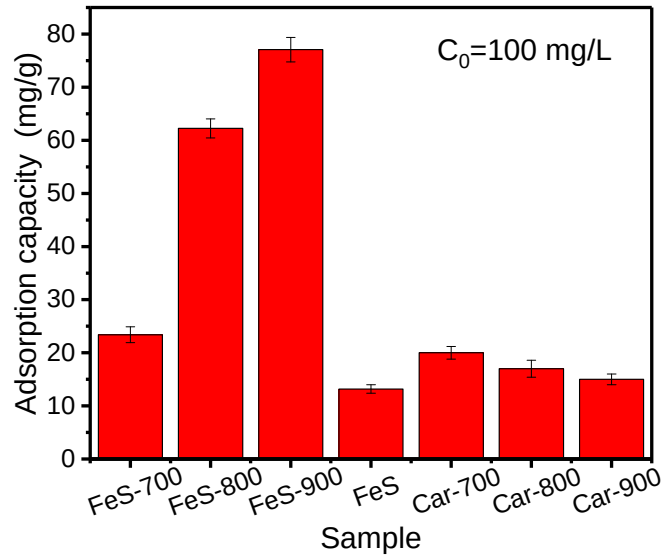


**Figure. S1.** The adsorption capacity of different samples (initial Cr(VI) concentration= 100 mg/L).

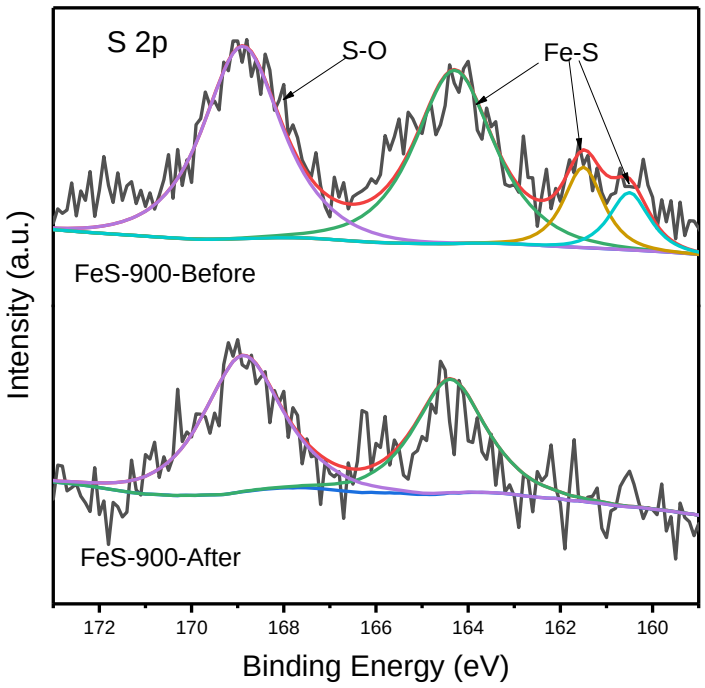


**Figure. S2.** The XPS spectrum of S 2p of FeS-900 before and after adsorption.