Supplementary Information

Organosulfur Adsorbents by Self-Assembly of
Titania Based Ternary Metal Oxide Nanofibers

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**Figure S1.** From left to right: CuO/La₂O₃/TiO₂, Ag₂O/La₂O₃/TiO₂ and Au/La₂O₃/TiO₂ after calcination at 500 °C for two hrs.

**Figure S2.** SEM images of CuO/La₂O₃/TiO₂ calcined at 600 (a), 700 (b), 800 (c), 900 (d), and 1000 °C (e).
Figure S3. XRD patterns of CuO/La$_2$O$_3$/TiO$_2$ calcined at 600 °C (baby blue), 700 °C (orange), 800 °C (black), 900 °C (yellow), and 1000 °C (blue).
Figure S4. XRD patterns of TiO$_2$ nanofibers calcined at 500 °C (baby blue), 600 °C (orange), 700 °C (black), 800 °C (yellow), 900 °C (blue), and 1000 °C (green).
**Figure S5.** Raman spectra of the CuO/La$_2$O$_3$/TiO$_2$ calcined at 600 °C (black), 700 °C (red), 800 °C (green), 900 °C (yellow), and 1000 °C (blue). Only anatase and rutile peaks can be observed.
Figure S6. EDS spectrum of CuO/La$_2$O$_3$/TiO$_2$ that was used for thiol adsorption.

Figure S7. Raman spectra of the fresh (green) and used (yellow) CuO/La$_2$O$_3$/TiO$_2$ collected using the same parameters. The anatase peak intensities from the used adsorbent are lower than those from the fresh counterpart; a result of the surface covered with the adsorbate molecules.
Figure S8. XPS scan of the CuO/La$_2$O$_3$/TiO$_2$ sample.
Figure S9. XPS scan of the Ag$_2$O/La$_2$O$_3$/TiO$_2$ sample.
Figure S10. XPS scan of the Au/La$_2$O$_3$/TiO$_2$ sample.
Figure S11. High resolution XPS, Ti$_{2p}$ of CuO/La$_2$O$_3$/TiO$_2$. For Ti$_{3p}$, 3/2, binding energy = 458.1 eV, FWHM = 1.1 eV. It is noted that the FWHM in this HR XPS is different from the scan in Figure S8.
Figure S12. High resolution XPS, Ti$_{2p}$ of Ag$_2$O/La$_2$O$_3$/TiO$_2$. For Ti$_{3p}$, $3/2$, binding energy = 458.4 eV, FWHM = 1.0 eV. It is noted that the FWHM in this HR XPS is different from the scan in Figure S9.
Figure S13. High resolution XPS, Ti$_{2p}$ of Au/La$_2$O$_3$/TiO$_2$. For Ti$_{3p}$, 3/2, binding energy = 458.5 eV, FWHM = 1.0 eV. It is noted that the FWHM in this HR XPS is different from the scan in Figure S10.
Figure S14. La_{3p} of CuO/La_2O_3/TiO_2. Binding energy = 834.8 eV, FWHM = 3.5 eV. It is noted that the satellite peaks are not separated well and the FWHM is manually obtained.
La₃p of Ag₂O/La₂O₃/TiO₂. Binding energy = 834.6 eV, FWHM = 3.5 eV. It is noted that the satellite peaks are not separated well and the FWHM is manually obtained.
Figure S16. La₃p of Au/La₂O₃/TiO₂. Binding energy = 834.6 eV, FWHM = 3.5 eV. It is noted that the satellite peaks are not separated well and the FWHM is manually obtained.
**Figure S17.** La$_{3p}$ of La$_2$O$_3$/TiO$_2$. Binding energy = 834.8 eV, FWHM = 2.9 eV. It is noted that the satellite peaks are not separated well and the FWHM is manually obtained.

**Table S1.** Comparison of anatase crystallite sizes of fresh and used adsorbents.

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<th>Fresh $D_{scher}^a$ (nm)</th>
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