

# Supplementary Information for Visible Light Induced Reactivity of Plasmonic Gold Nanoparticles Incorporated into TiO<sub>2</sub> Matrix towards 2- Chloroethyl Ethyl Sulfide

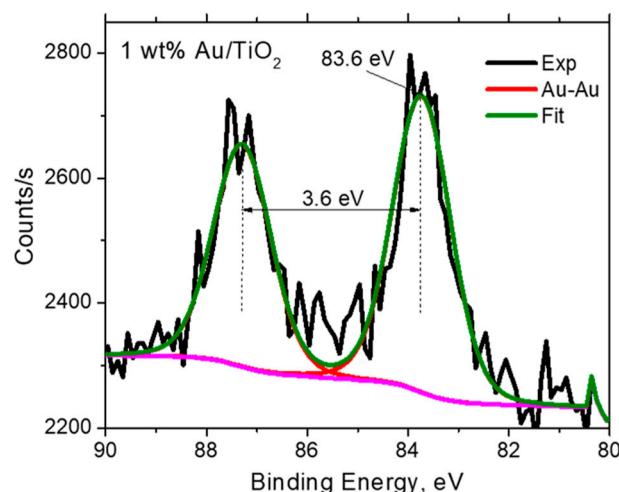
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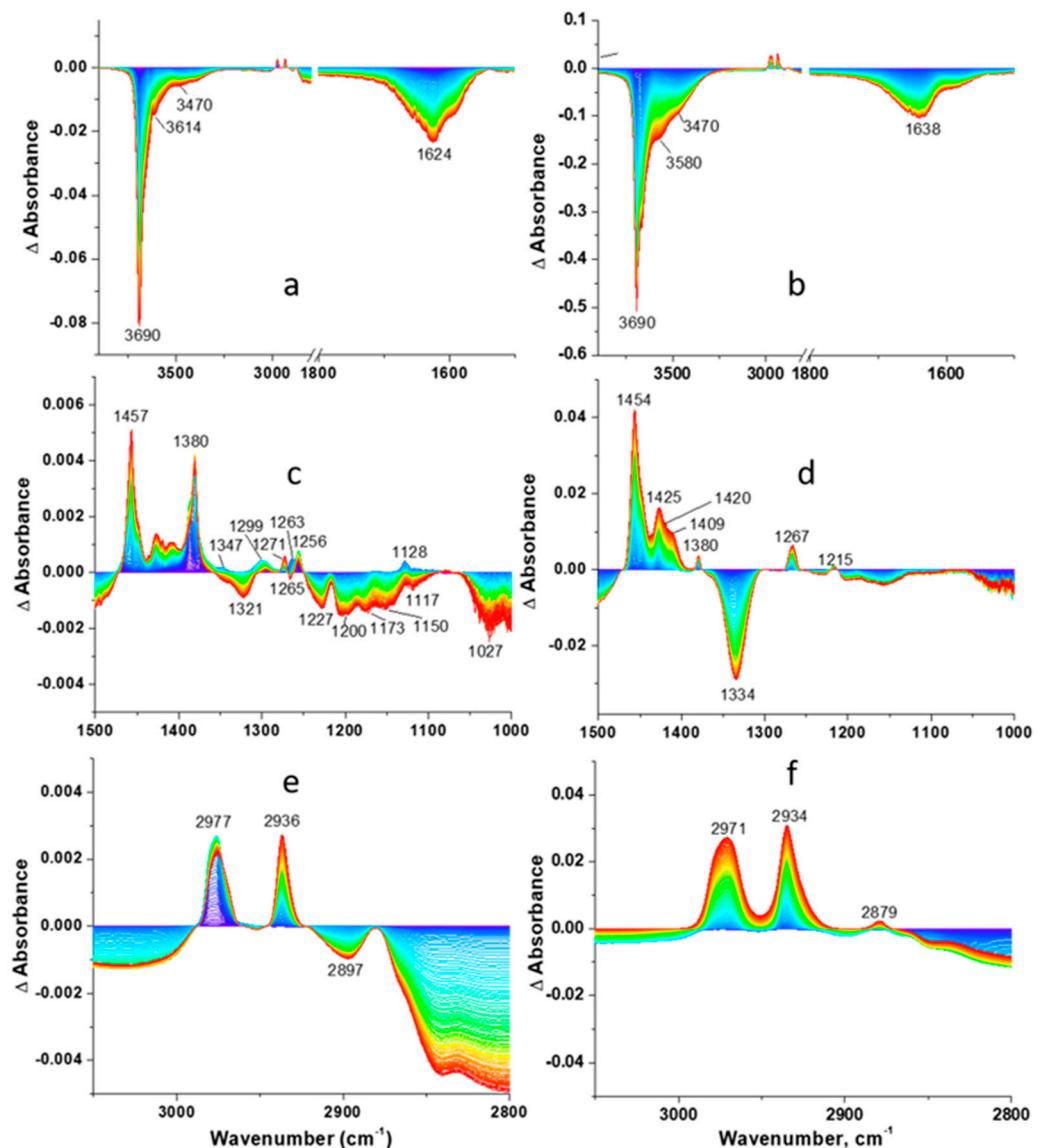
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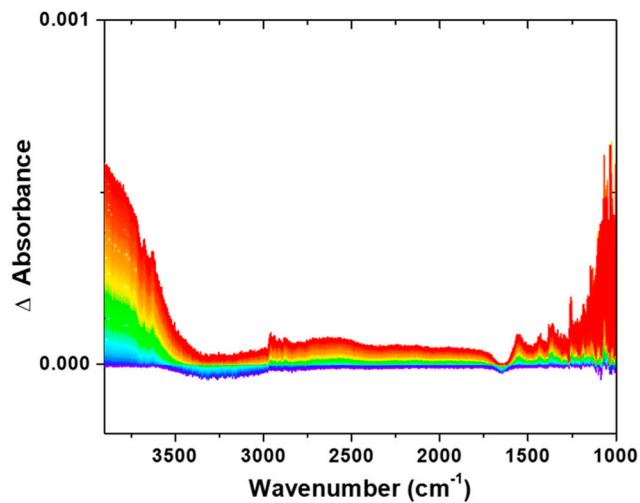
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**Figure 1.** Au4f high resolution spectrum collected from 1 wt% Au/TiO<sub>2</sub> photocatalyst and fitted as a 4f<sub>7/2</sub> and 4f<sub>5/2</sub> doublet.



**Figure 2.** DRIFTS difference spectra of (a,c,e) Au/TiO<sub>2</sub> and (b, d, f) TiO<sub>2</sub> photocatalysts recorded during 2-CEES dosing in aerobic conditions in the dark. (a, b) – OH, (c, d) – fingerprint, and (e, f) aliphatic regions.



**Figure 3.** DRIFTS difference spectra of  $\text{Au}/\text{TiO}_2$  photocatalyst collected under visible excitation in aerobic conditions following CEES dosing and air purge.