Electronic Supplementary Information

# *In-situ* surface-enhanced Raman scattering and X-ray photoelectron spectroscopic investigation of coenzyme Q$_{10}$ on silver electrode

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**Table S1** The intensities and band assignments in Raman spectra and SERS spectra of $CoQ_{10}$

| Observed frequency ($v/cm^{-1}$) | | Assignment | EF ($10^3$) |
|---|---|---|---|
| Solid | SERS on Ag electrode | | |
| 2965 (w) | 2973 (m) | Symmetric =CH stretching | 0.9 |
| 2933 (m) | 2928 (s) | Antisymmetric $CH_2$ stretching | 0.7 |
| 2891 (m) | 2878 (m) | Symmetric $(CH_2)$C-H stretching | 0.4 |
| 1662 (s) | 1651 (s) | C=O stretching | 0.5 |
| 1609 (w) | 1607 (m) | C=C stretching | 1.0 |
| 1440 (w) | 1450 (m) | Asymmetric $CH_2$ deformation | 0.9 |
| 1281 (m) | 1276 (w) | C-$OCH_3$ stretching | 0.2 |
| 1101 (w) | 1096 (m) | $OCH_3$ stretching | 3.2 |
| 1038 (w) | 1048 (m) | C-H deformation | 2.4 |
| 995 (m) | 999 (m) | Ring breathing | 0.8 |
| 876 (w) | 883 (s) | C-H out-of-plane deformation | 4.5 |

s-strong, m-medium, w-weak, Ø-phenyl

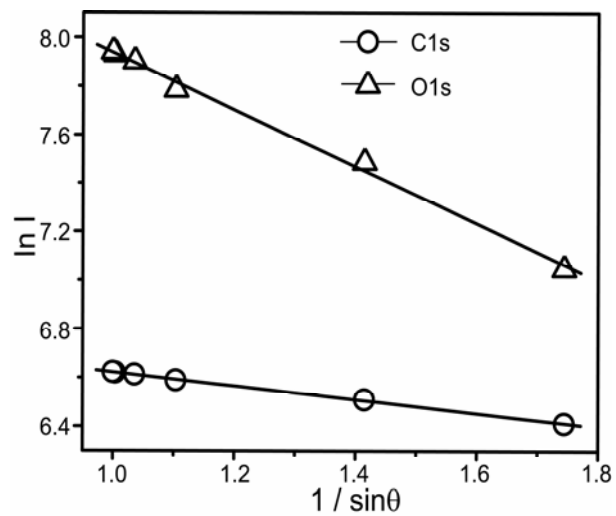**Fig. S1** The logarithm of intensity of C1s (circles) and O 1s (triangles) as a function of 1/sinθ, where θ is the take-off angle.
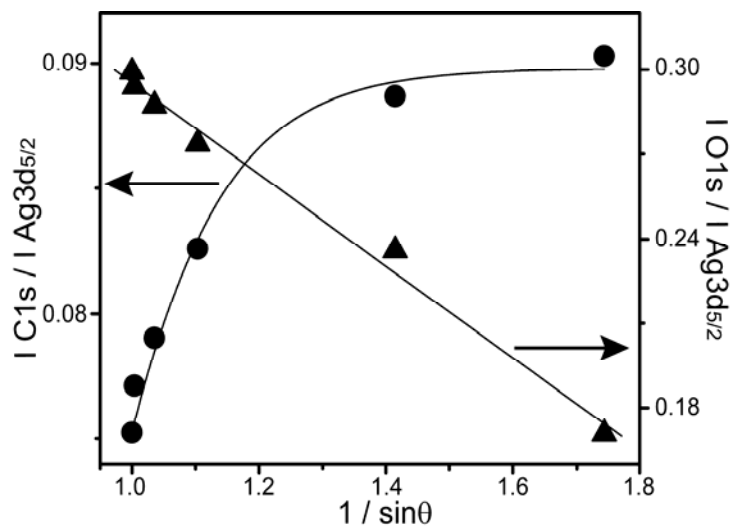
**Fig. S2** The C1s/Ag3d$_{5/2}$ (circles) and O1s/Ag3d$_{5/2}$ (triangles) experimental intensity ratios as a function of 1/sinθ, where θ is the take-off angle.
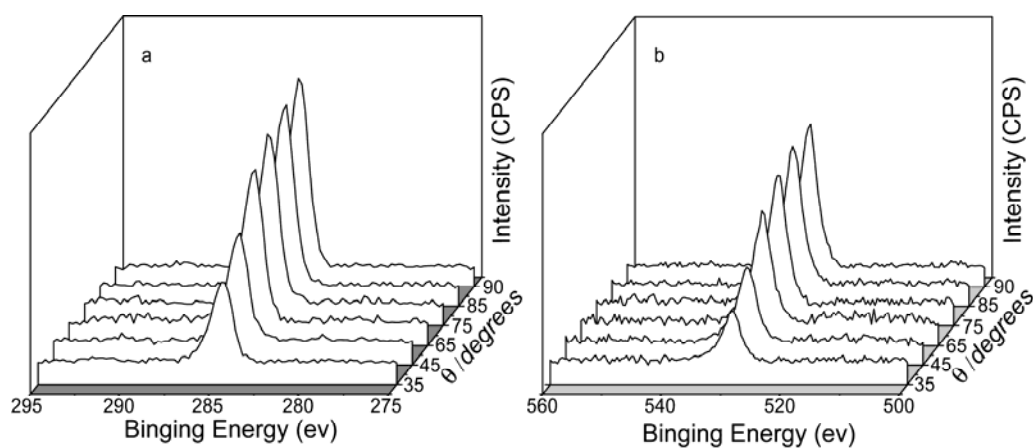
**Fig. S3** High-resolution C1s (a) and O1s (b) XPS spectra for $CoQ_0$ self-assembled on Ag surface measured at different take-off angles, $\theta$ is the take-off angle.
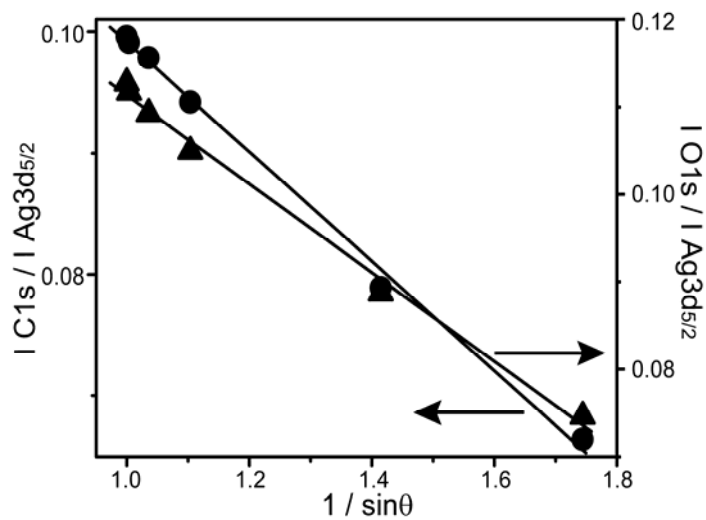
**Fig. S4** The C1s/Ag3d$_{5/2}$ (circles) and O1s/Ag3d$_{5/2}$ (triangles) experimental intensity ratios as a function of 1/sinθ, where θ is the take-off angle.
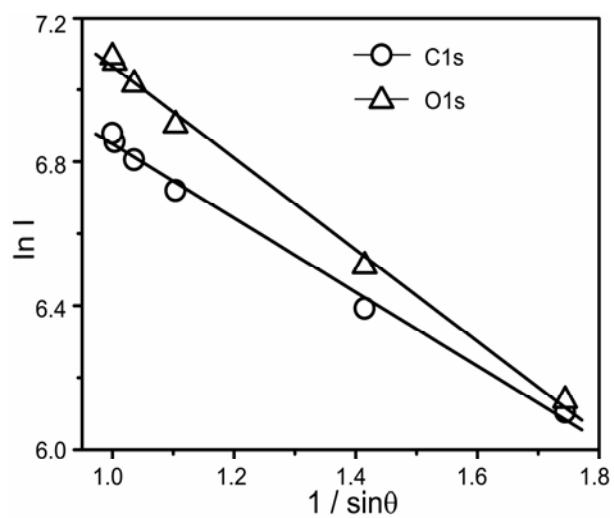
**Fig. S5** The logarithm of intensity of C1s (circles) and O1s (triangles) as a function of 1/sinθ, where θ is the take-off angle.