

Vibrational Spectroscopy of Dispersed $\text{Re}^{\text{VII}}\text{O}_x$ Sites Supported on Monoclinic Zirconia.

SUPPLEMENTARY INFORMATION

Chrysanthi Andriopoulou,¹ Theocharis Kentri¹ and Soghomon Boghosian*^{1,2,3}

¹ *Department of Chemical Engineering, University of Patras, Patras, Greece*

² *Institute of Chemical Engineering Sciences, FORTH/ICE-HT, Patras, Greece*

³ *School of Science and Technology, Hellenic Open University, GR-26335 Patras, Greece*

(*) to whom correspondence should be addressed

e-mail: bogosian@chemeng.upatras.gr

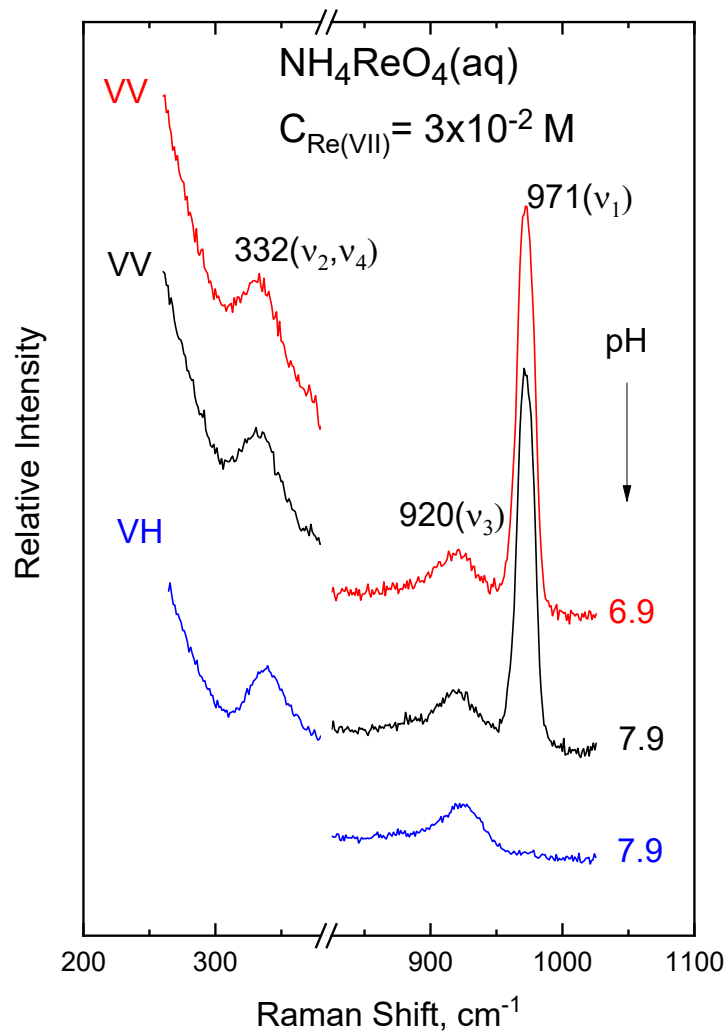


Figure S1. Raman spectra of $\text{NH}_4\text{ReO}_4(\text{aq})$ solutions with $C_{\text{Re(VII)}} = 3 \times 10^{-2} \text{ M}$ with pH of 6.9 and 7.9. The VV polarization configurations are shown for both solutions. The HV polarization configuration is also shown for the solution with pH=7.9. Laser wavelength, $\lambda_0 = 532.0 \text{ nm}$; laser power, 50 mW; resolution, 2 cm^{-1} .

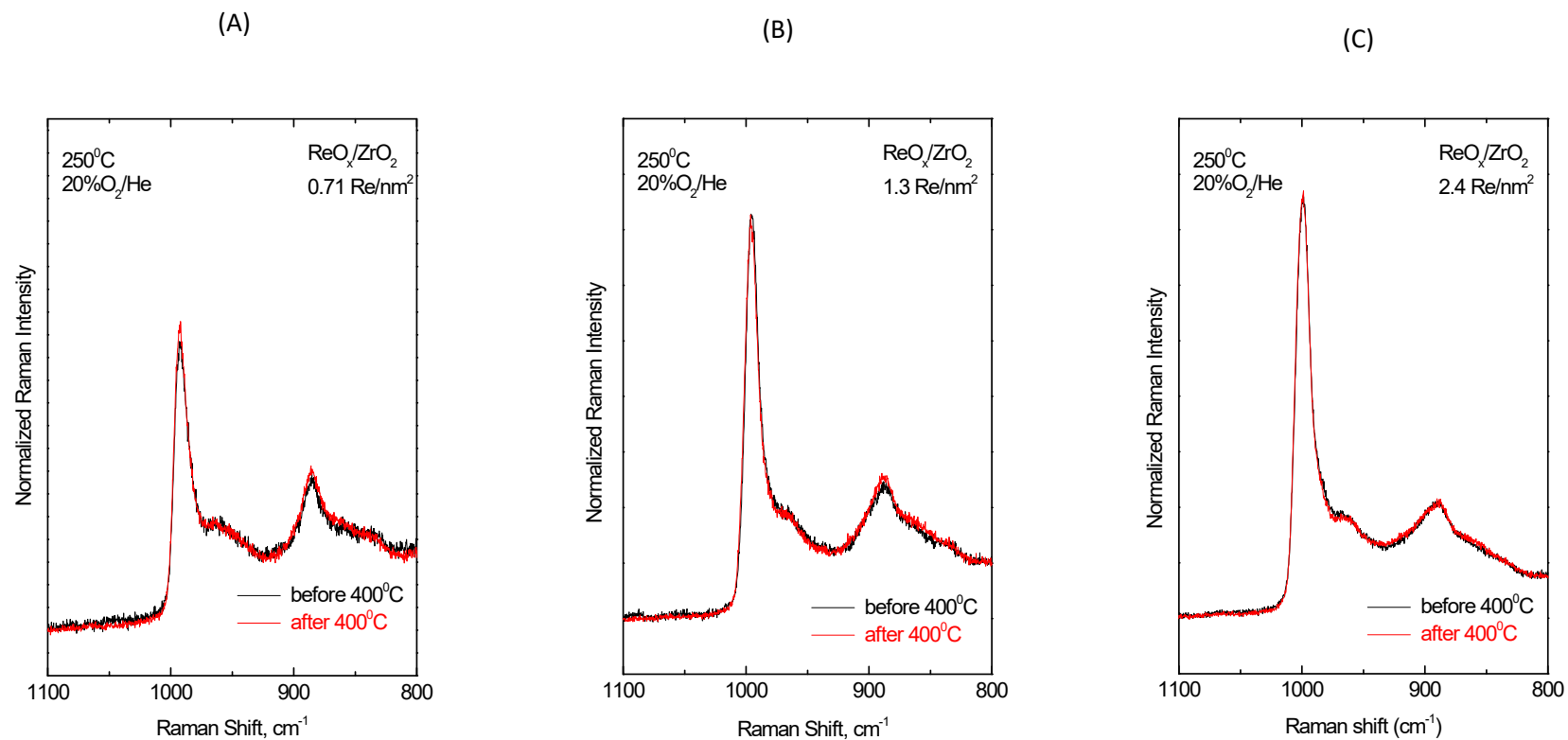


Figure S2. *In situ* Raman spectra obtained at 250°C under flowing 20% O_2/He for $\text{ReO}_x/\text{ZrO}_2$ catalysts with surface densities of: (A) 0.71 Re/nm^2 ; (B) 1.3 Re/nm^2 ; and (C) 2.4 Re/nm^2 . The black trace is obtained before heating at 400°C and the red trace is obtained after heating at 400°C. Spectral recording parameters: see Figure 2 caption.

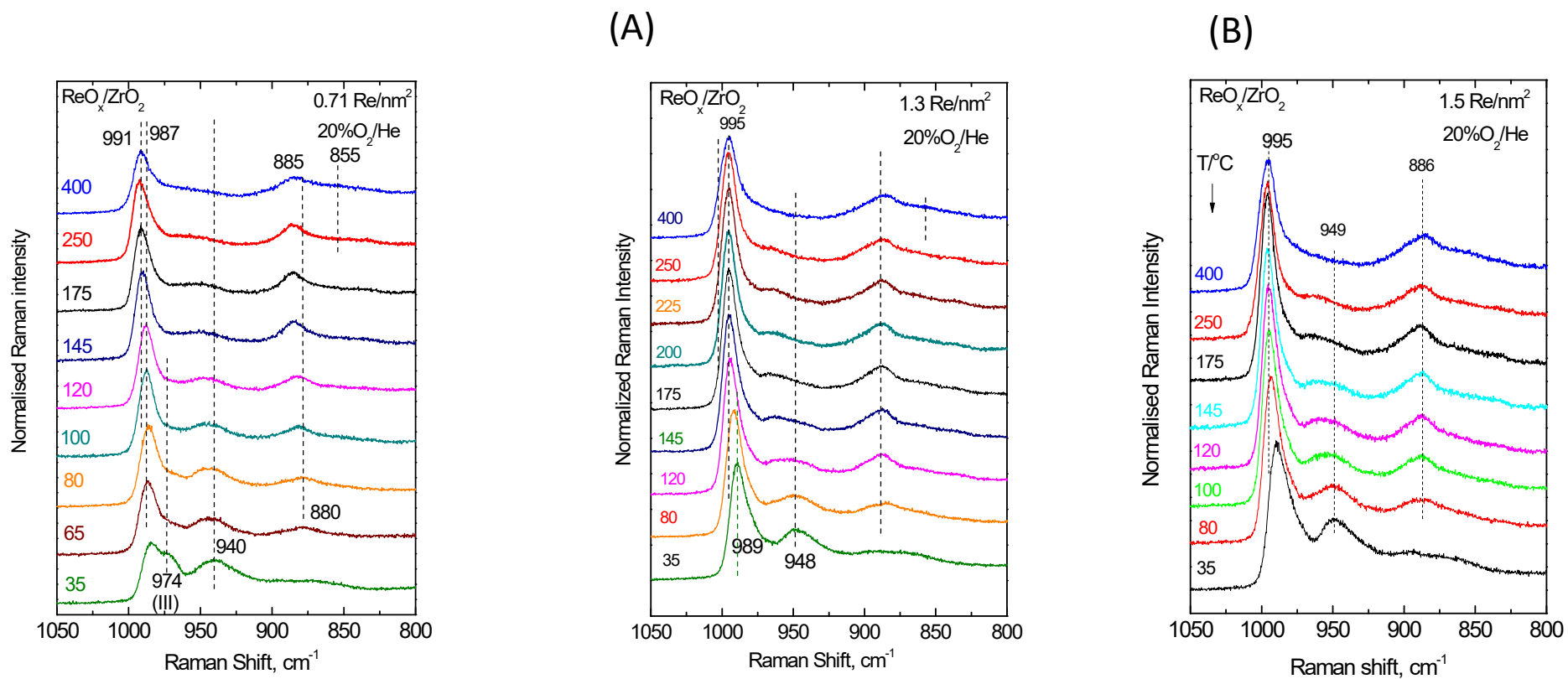


Figure S3. Sequential (430 \rightarrow 250 \rightarrow 175 \rightarrow 145 \rightarrow 120 \rightarrow 100 \rightarrow 80 \rightarrow 35 °C) *in situ* Raman spectra obtained under flowing 20% O_2/He at temperatures as indicated by each spectrum for $\text{ReO}_x/\text{ZrO}_2$ catalysts with surface densities of : (A) 0.71 Re/nm^2 ; (B) 1.3 Re/nm^2 ; (C) 1.5 Re/nm^2 ; (D) 1.9 Re/nm^2 ; (E) 2.4 Re/nm^2 ; and (F) 3.7 Re/nm^2 . Spectral recording parameters: see Figure 2 caption.

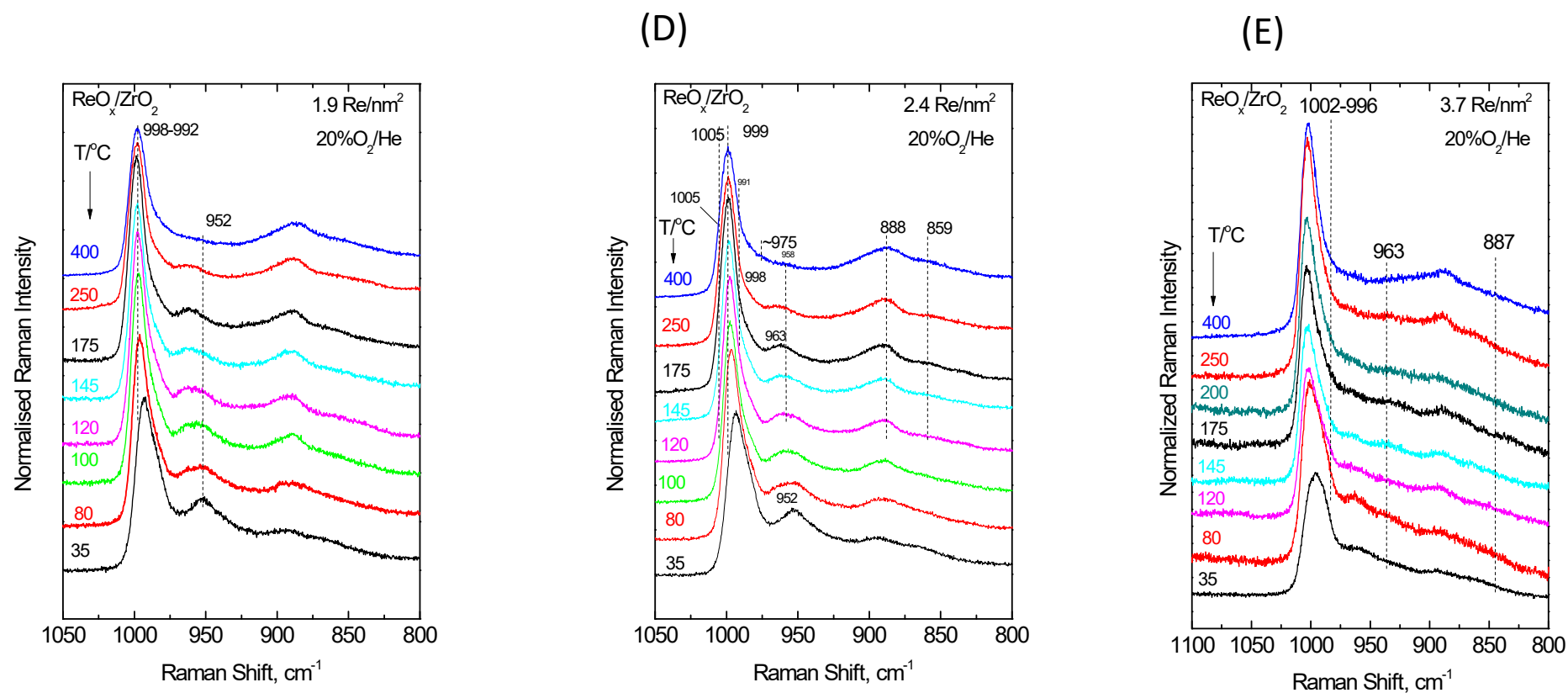


Figure S3. Sequential (430 \rightarrow 250 \rightarrow 175 \rightarrow 145 \rightarrow 120 \rightarrow 100 \rightarrow 80 \rightarrow 35 °C) *in situ* Raman spectra obtained under flowing 20% O_2/He at temperatures as indicated by each spectrum for $\text{ReO}_x/\text{ZrO}_2$ catalysts with surface densities of : (A) 0.71 Re/nm^2 ; (B) 1.3 Re/nm^2 ; (C) 1.5 Re/nm^2 ; (D) 1.9 Re/nm^2 ; (E) 2.4 Re/nm^2 ; and (F) 3.7 Re/nm^2 . Spectral recording parameters: see Figure 2 caption.