Supporting Information

Conversion of methane to methanol on copper mordenite: redox mechanism of isothermal and high temperature activation procedures

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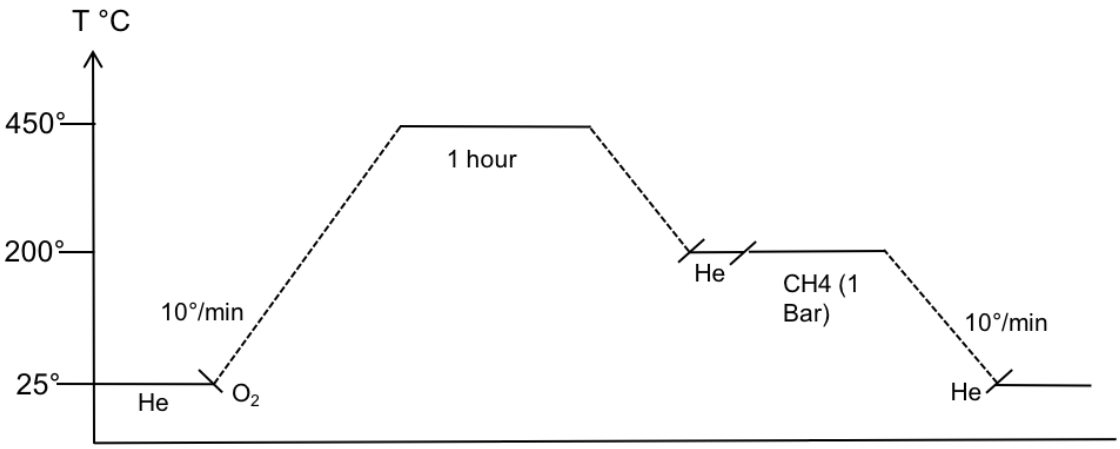

Figure S1: Treatment scheme for high temperature activation procedure

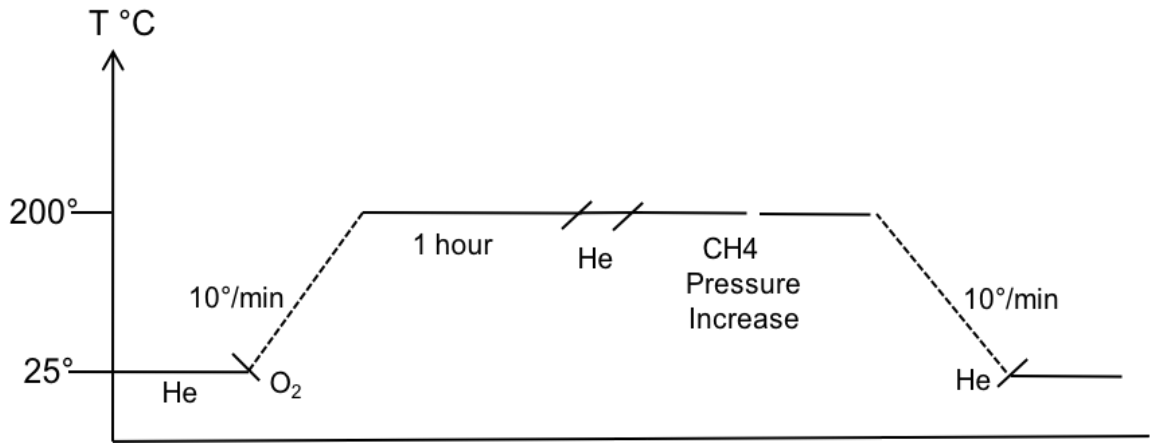

Figure S2: Treatment scheme for isothermal low temperature procedure

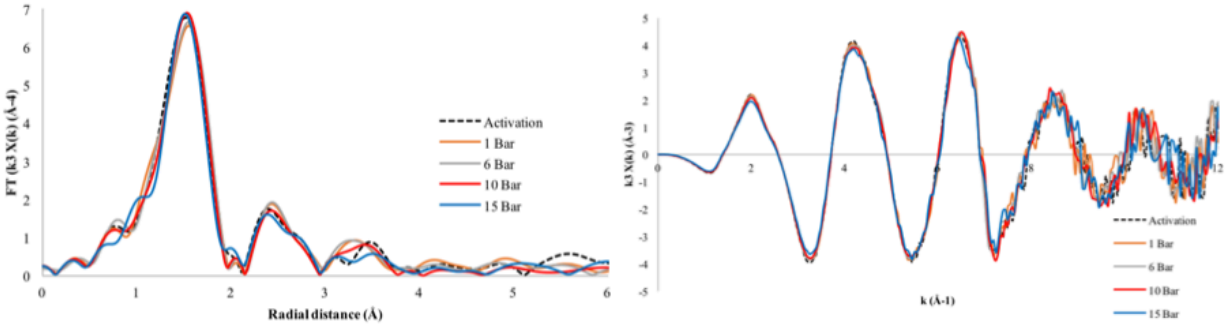

Figure S3: (*right*) k3 weighted FT weighted spectra as pressure increase (k range 3-12). (*left*) The corresponding k space as pressure is increased.

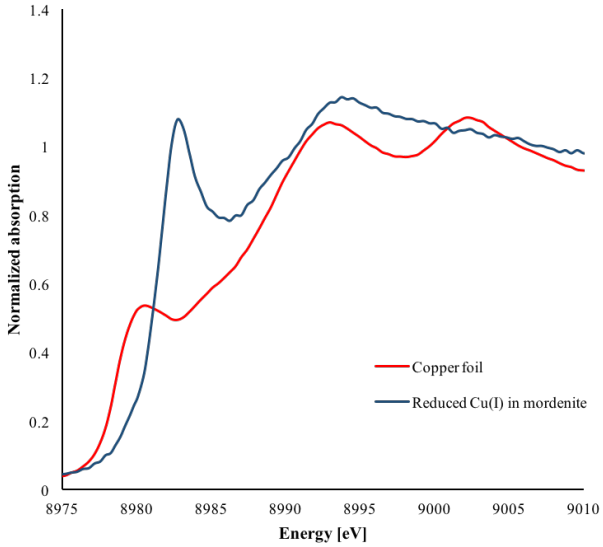

Figure S4: XANES spectra of Cu(I) reference and the copper foil reference. For Cu(I) reference, the copper exchanged mordenite was heated to 450°C under a methane environment.

The LCF and error bars was calculated by fitting the XANES spectra with the spectrum of the activated sample and the Cu(I). Experiment was conducted twice and was fitted two different ways by fitting the XANES absorption spectra and the derivative of the XANES.