Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Supporting Information

The effect of water adsorption on the structure of the carboxylate containing metal-organic frameworks Cu-BTC, Mg-MOF-74, and UiO-66

Jared B. DeCoste[1]*, Gregory W. Peterson[2], Bryan J. Schindler[1], Matthew A. Browe[2], Kato L. Killops[2], and John J. Mahle[2]

[1]Science Applications International Corporation (SAIC), Inc. PO Box 68, Gunpowder, MD 21010

[2]Edgewood Chemical Biological Center, 5183 Blackhawk Rd, Aberdeen Proving Ground, MD 21010

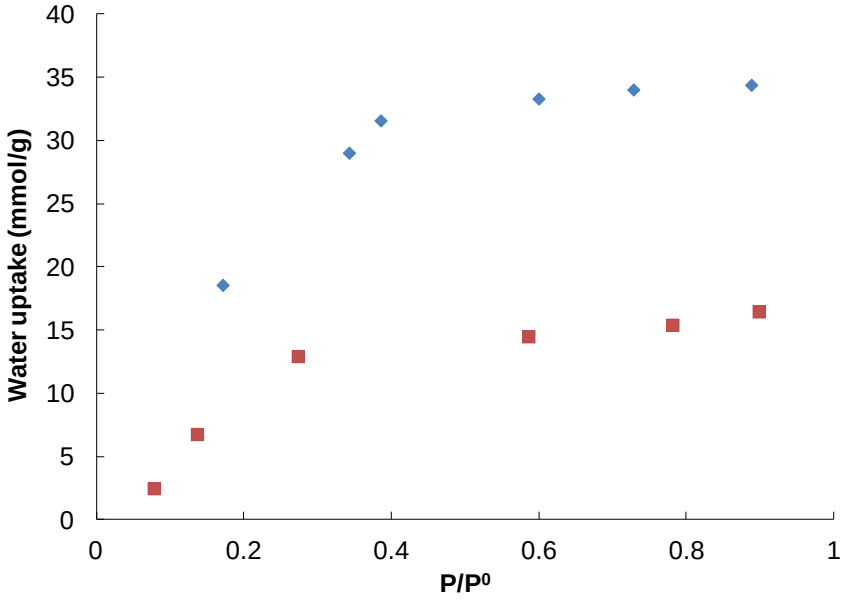

Figure S1. Water isotherm of Cu-BTC at 298K (blue diamonds) and 313K (red squares).

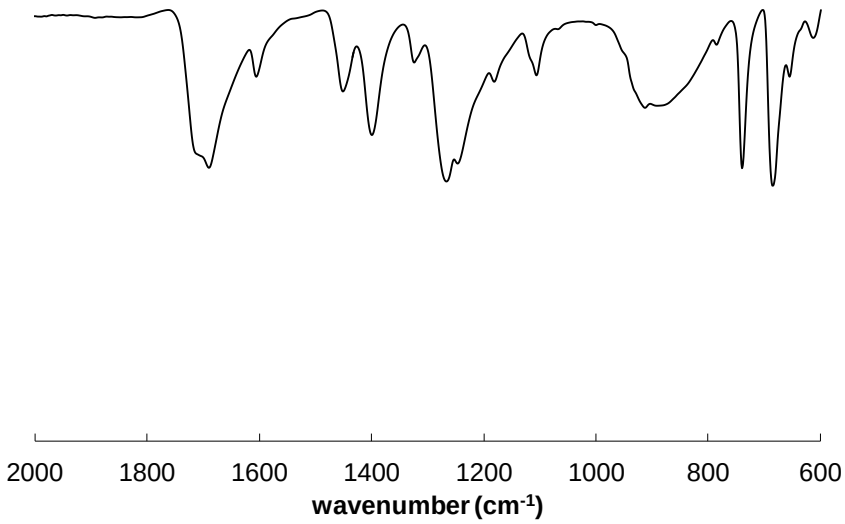

Figure S2. FTIR spectrum of 1,3,5-benzene tricarboxylic acid.

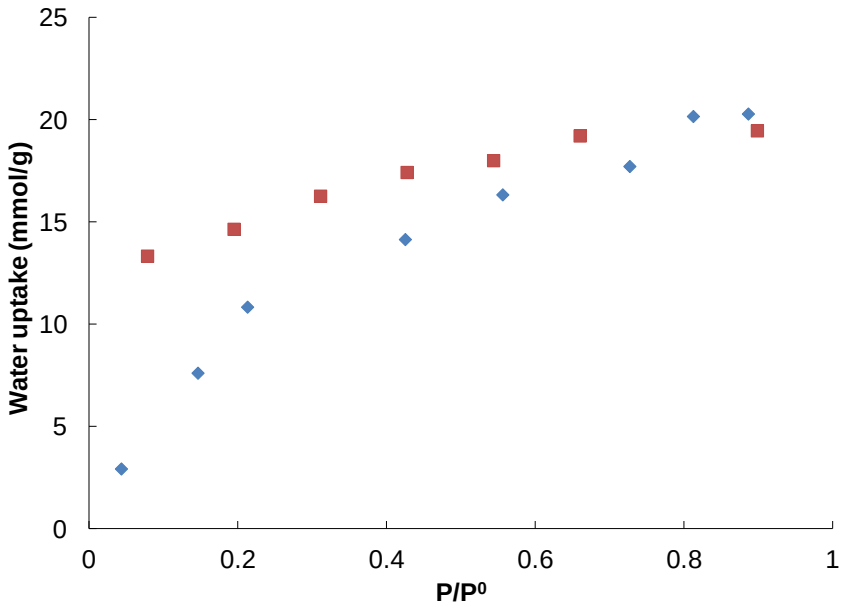

Figure S3. Water isotherm of Mg-MOF-74 at 298K (blue diamonds) and 313K (red squares).

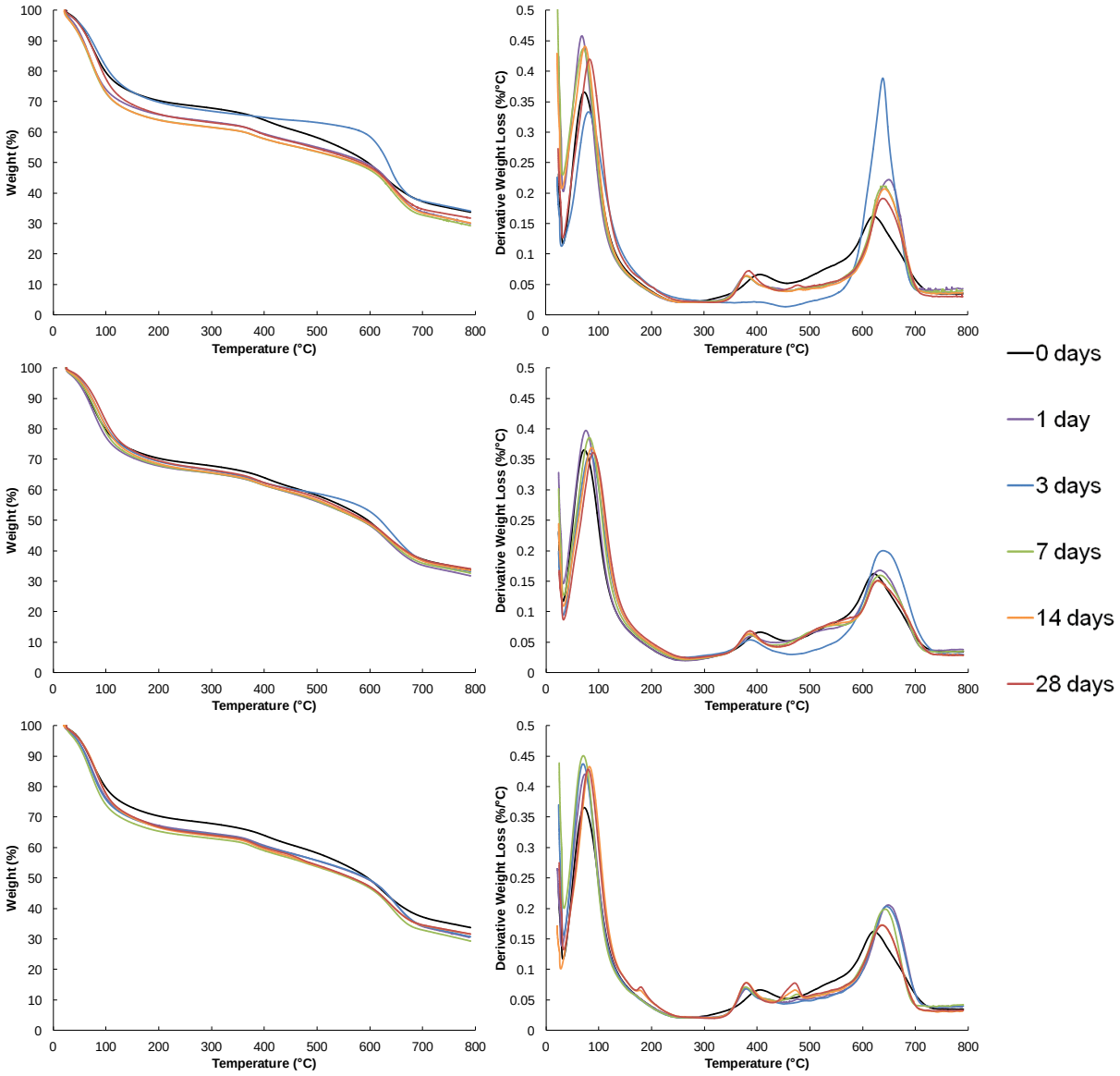

Figure S4. TGA plots (left) and the derivative of the TGA plots (right) for Mg-MOF-74 aged at 25°C/90% RH (top), 40°C/40% RH (middle), and 40°C/90% RH (bottom).

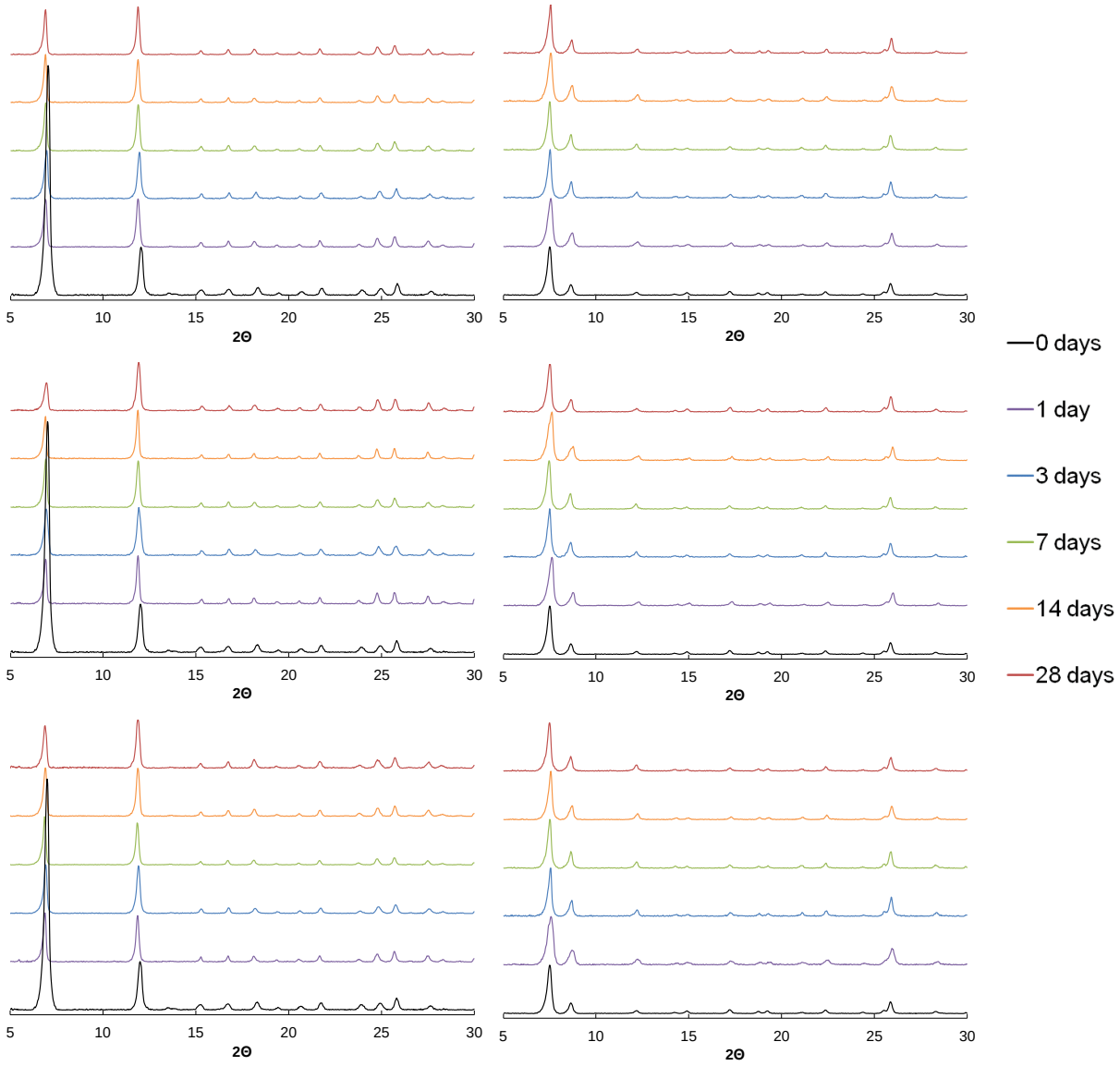

Figure S5. PXRD patterns for Mg-MOF-74 (left) and UiO-66 (right) aged at 25°C/90% RH (top), 40°C/40% RH (middle), and 40°C/90% RH (bottom).

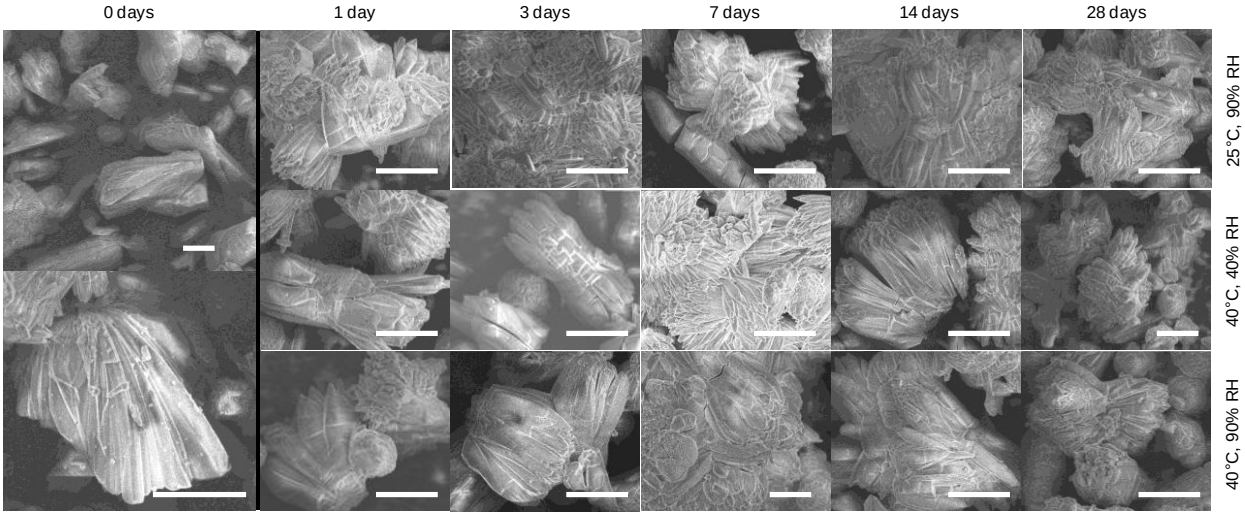

Figure S6. SEM images of Mg-MOF-74 aged at 25°C/90% RH (top), 40°C/40% RH (middle), and 40°C/90% RH (bottom). The scale bars represents 10 µm.

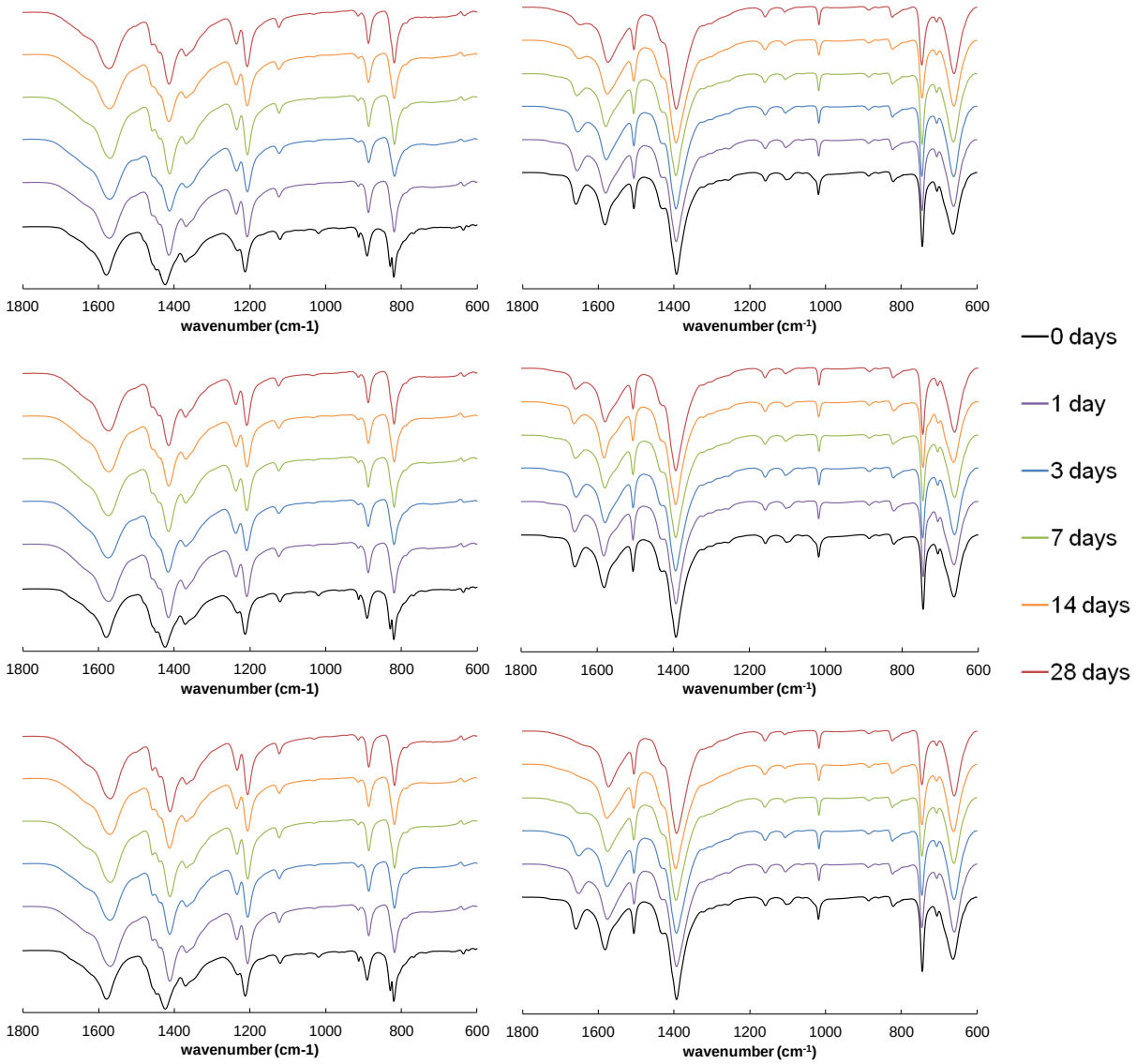

Figure S7. FTIR spectra from 1800 to 600 cm^{-1} for Mg-MOF-74 (left) and UiO-66 (right) aged at 25°C/90% RH (top), 40°C/40% RH (middle), and 40°C/90% RH (bottom).

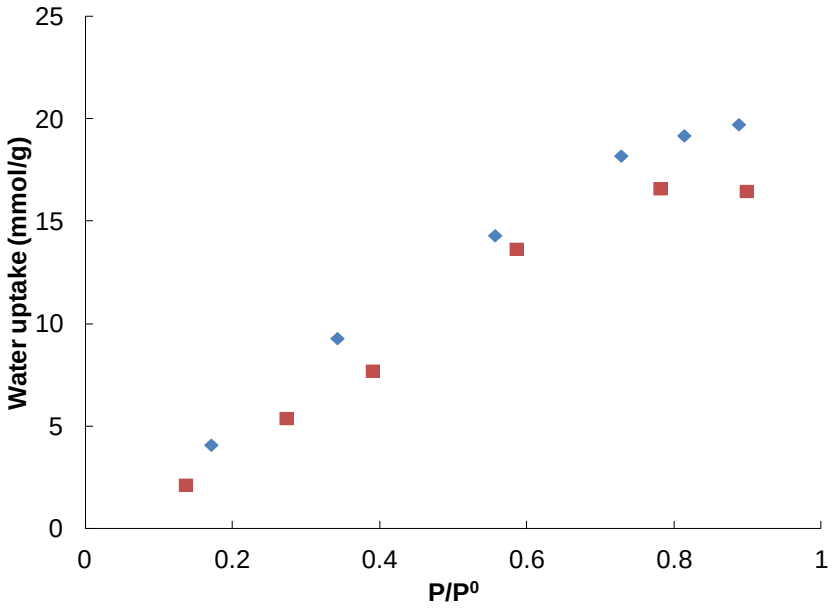

Figure S8. Water isotherm of UiO-66 at 298K (blue diamonds) and 313K (red squares).

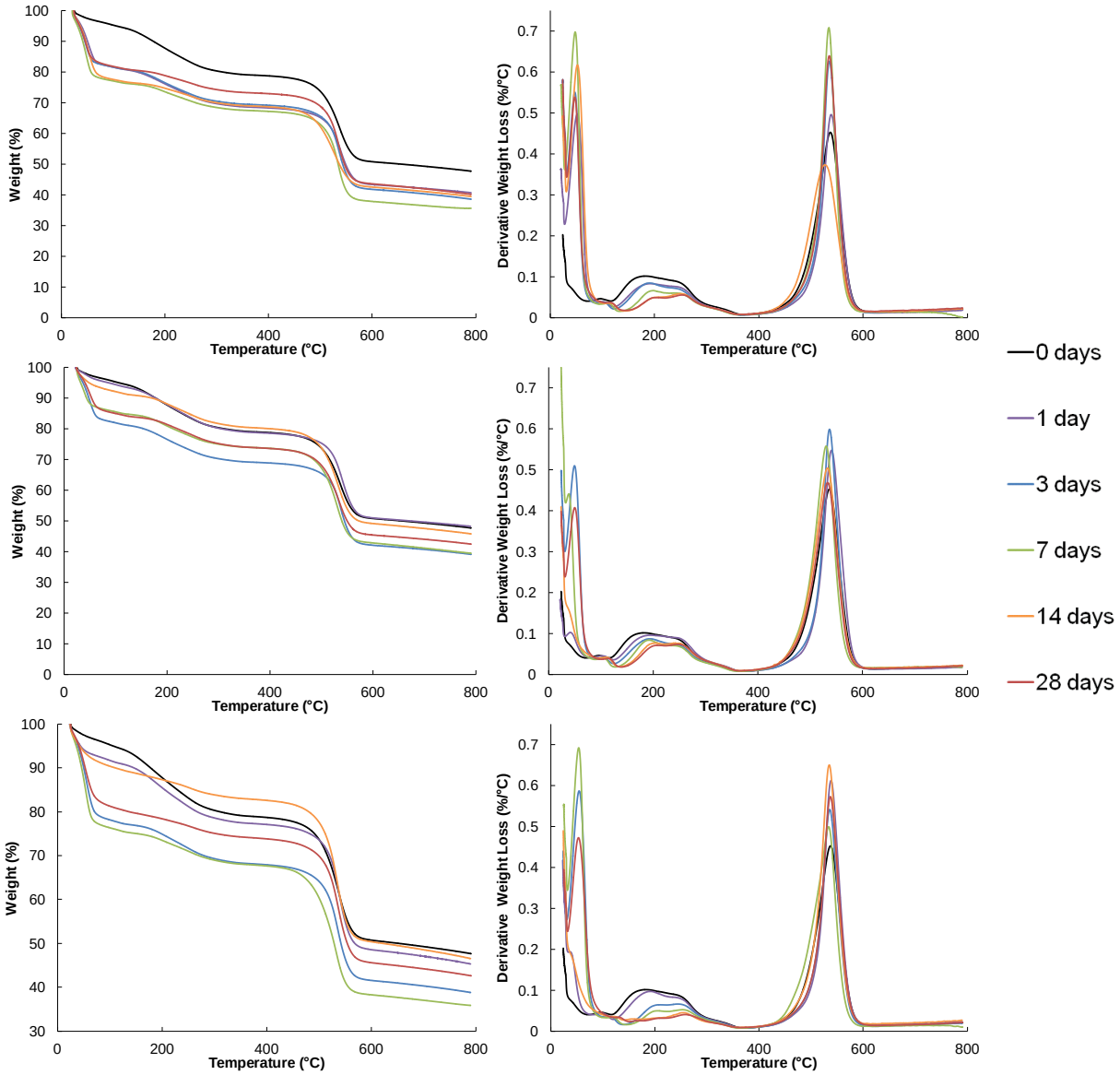

Figure S9. TGA plots (left) and the derivative of the TGA plots (right) for UiO-66 aged at 25°C/90% RH (top), 40°C/40% RH (middle), and 40°C/90% RH (bottom).

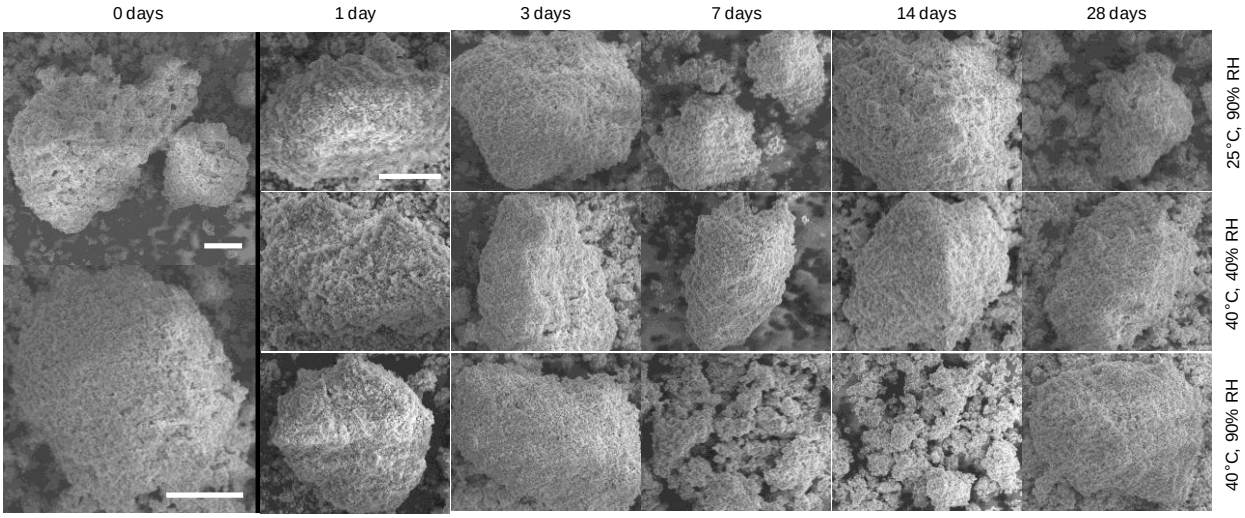

Figure S10. SEM images of UiO-66 aged at 25°C/90% RH (top), 40°C/40% RH (middle), and 40°C/90% RH (bottom). The scale bar represents 10 µm; the scale is the same for each of the aged samples.