

SUPPLEMENTARY MATERIAL

Improvements in the pre-combustion carbon dioxide sorption capacity of a magnesium oxide-cesium carbonate sorbent

Christian Vogt^{#^}, Shery LY Chang⁺, Jamileh Taghavimoghaddam[^] and Alan L Chaffee^{#^*}

[#] Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC), [^]School of Chemistry, Monash University, VIC 3800 Australia

⁺ Monash Centre for Electron Microscopy, Monash University, VIC 3800 Australia

⁺ Current Address: Ernst Ruska-Centrum, Forschungszentrum Jülich GmbH, 52425 Jülich, Germany

^{*} corresponding author: alan.chaffee@monash.edu

Phone: +61 3 990-54626, Fax: +61 3 990-54597

1 Nitrogen physisorption isotherms and BJH pore volume distribution

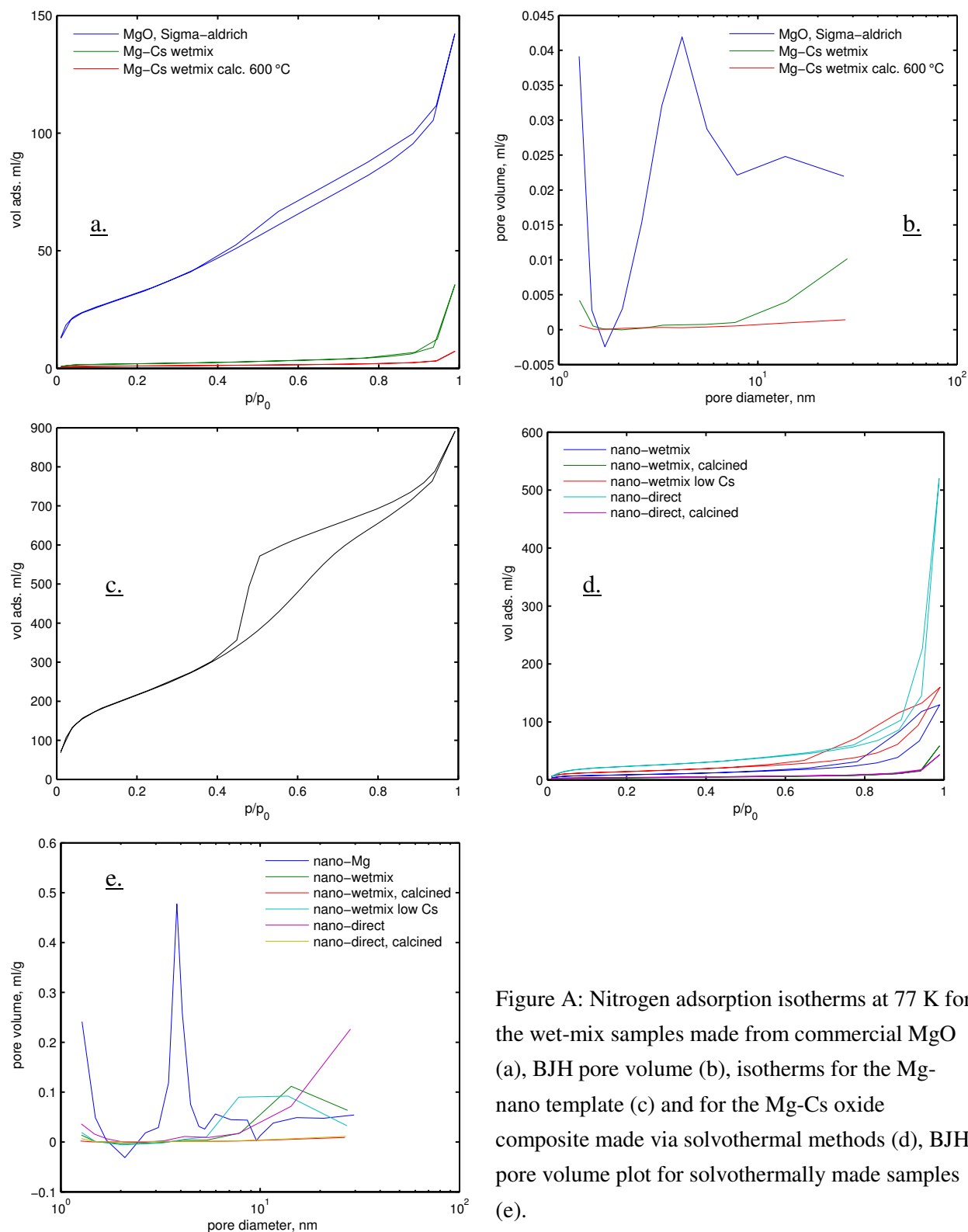
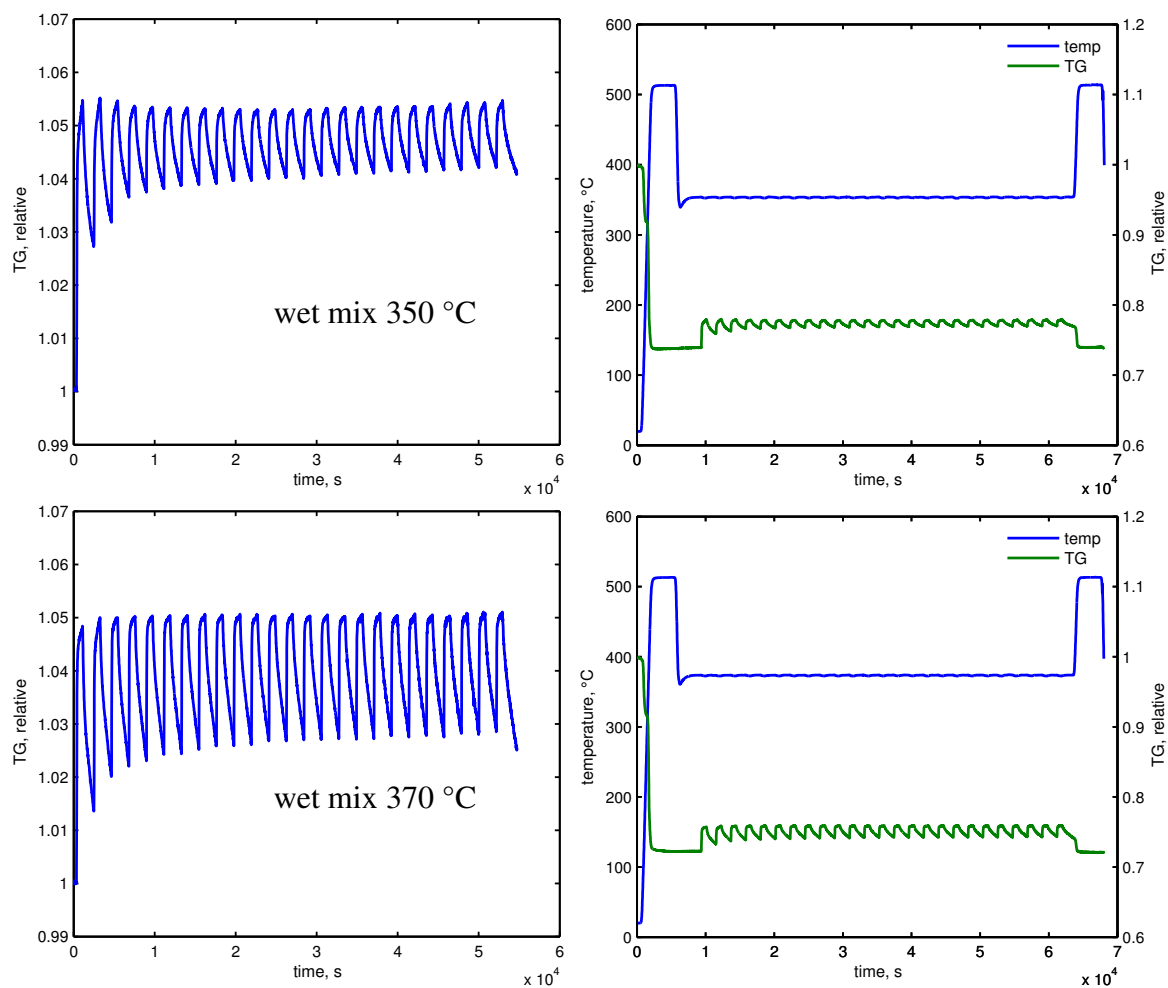
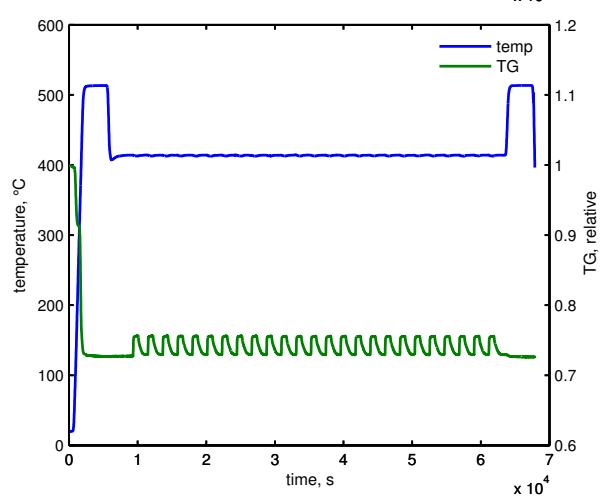
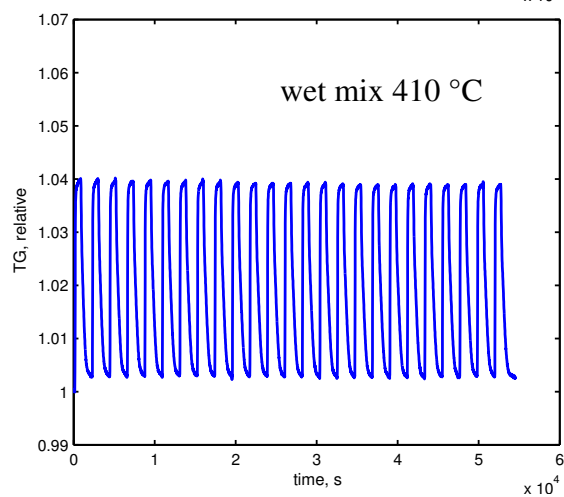
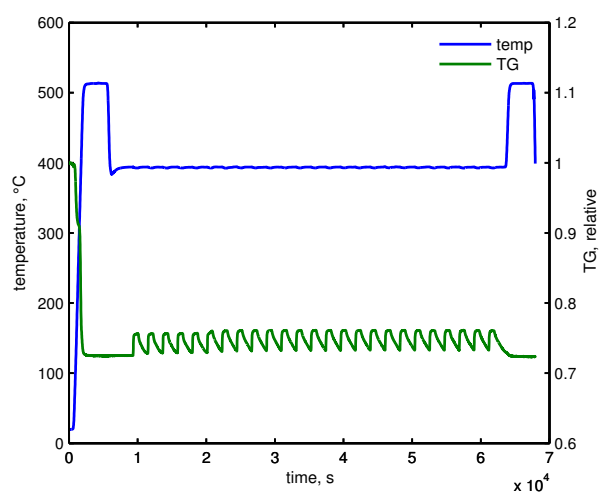
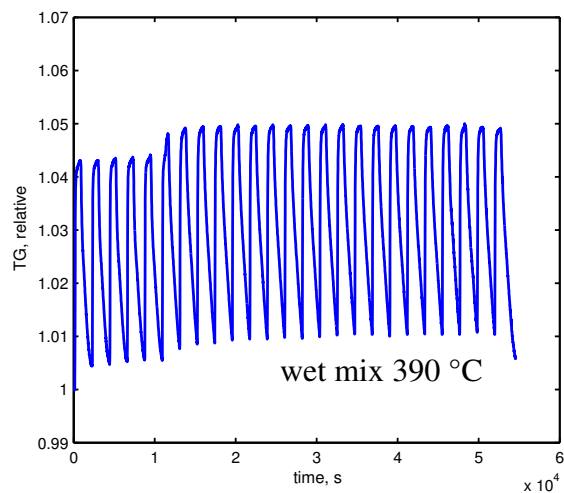
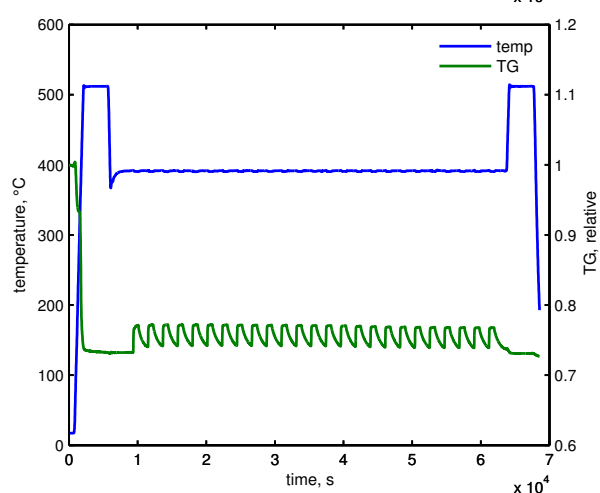
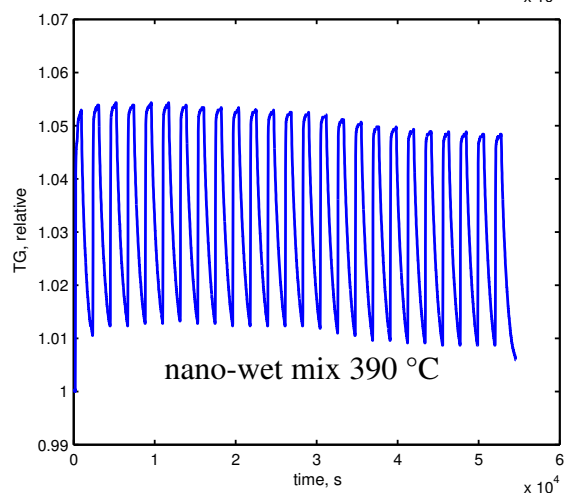
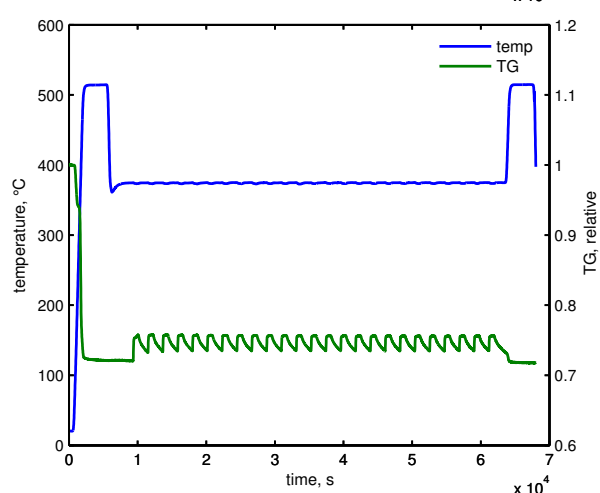
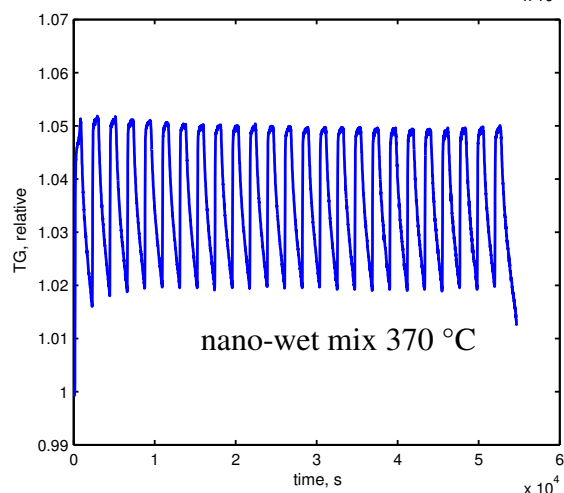
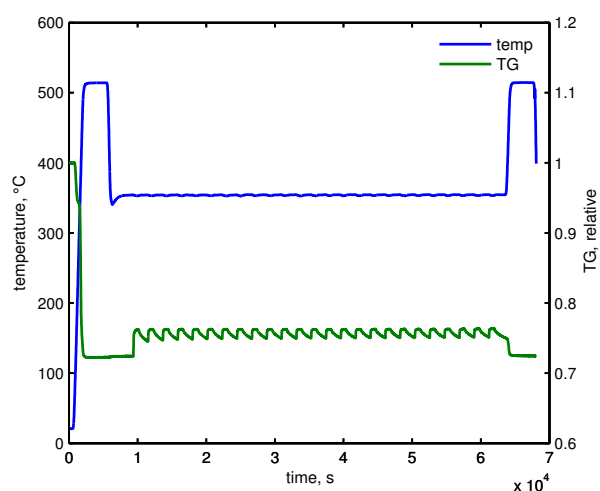
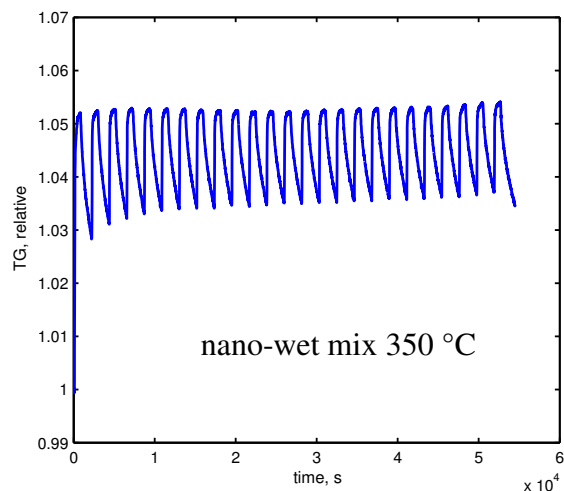


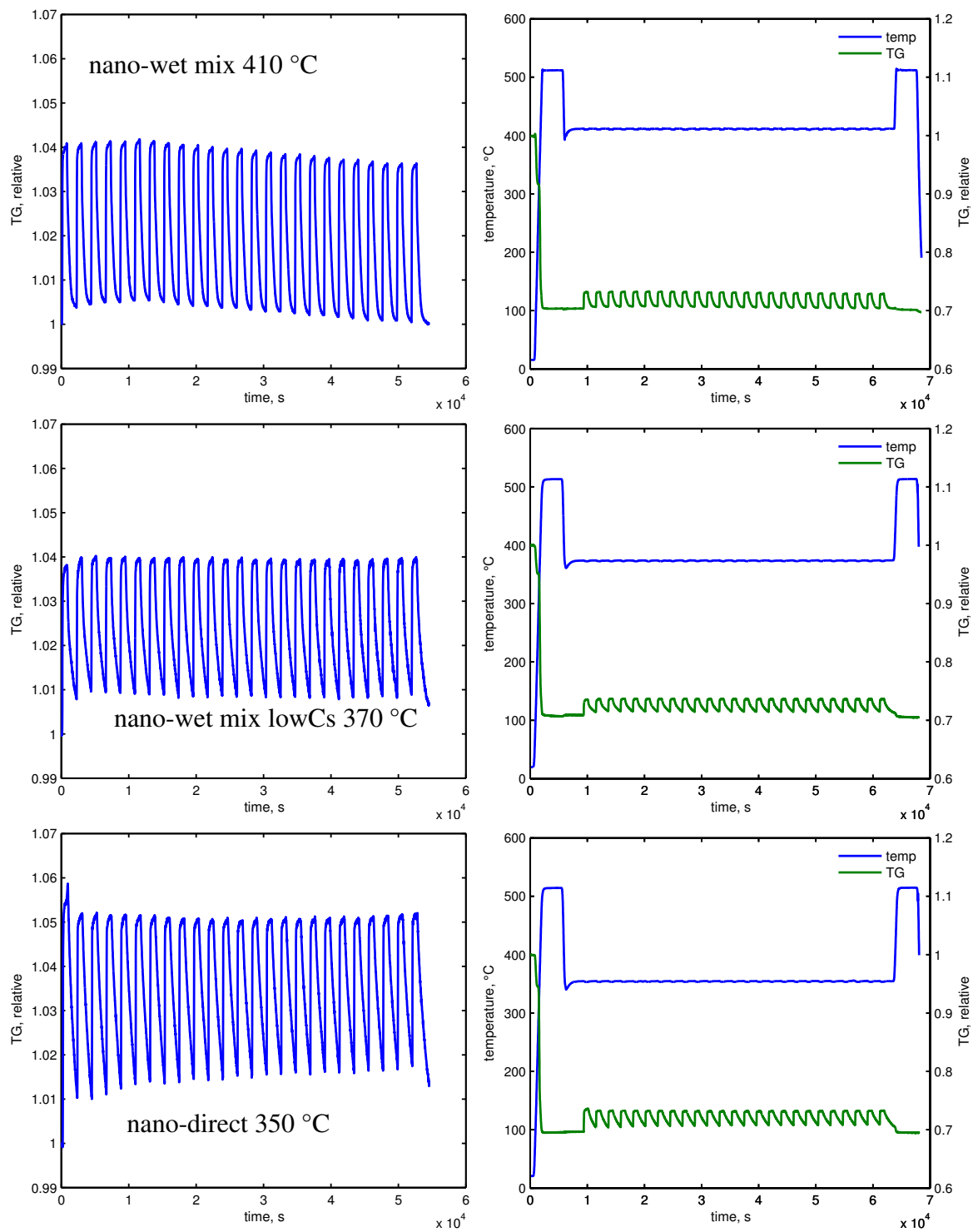
Figure A: Nitrogen adsorption isotherms at 77 K for the wet-mix samples made from commercial MgO (a), BJH pore volume (b), isotherms for the Mg-nano template (c) and for the Mg-Cs oxide composite made via solvothermal methods (d), BJH pore volume plot for solvothermally made samples (e).

2 Detailed TGA plots









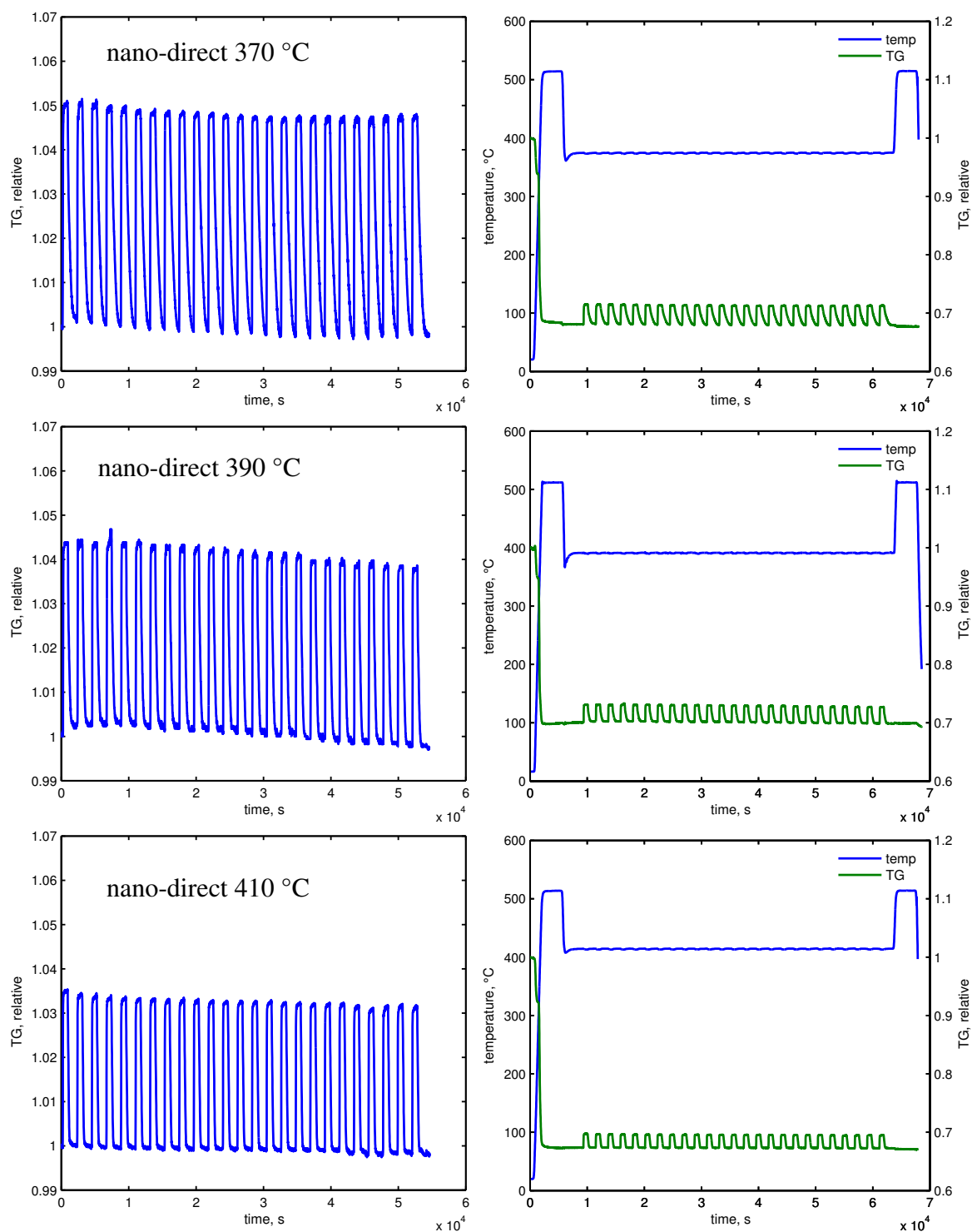
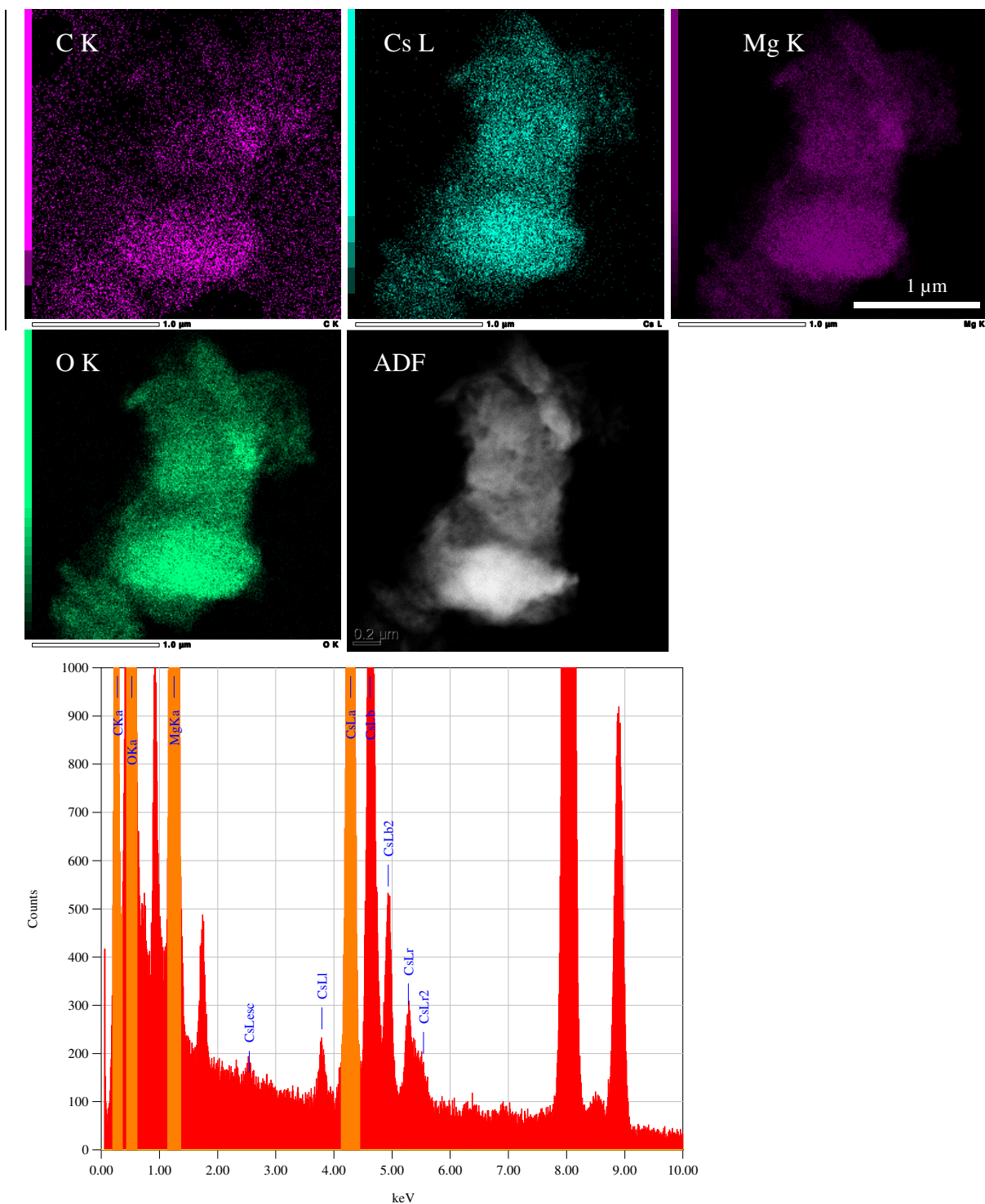


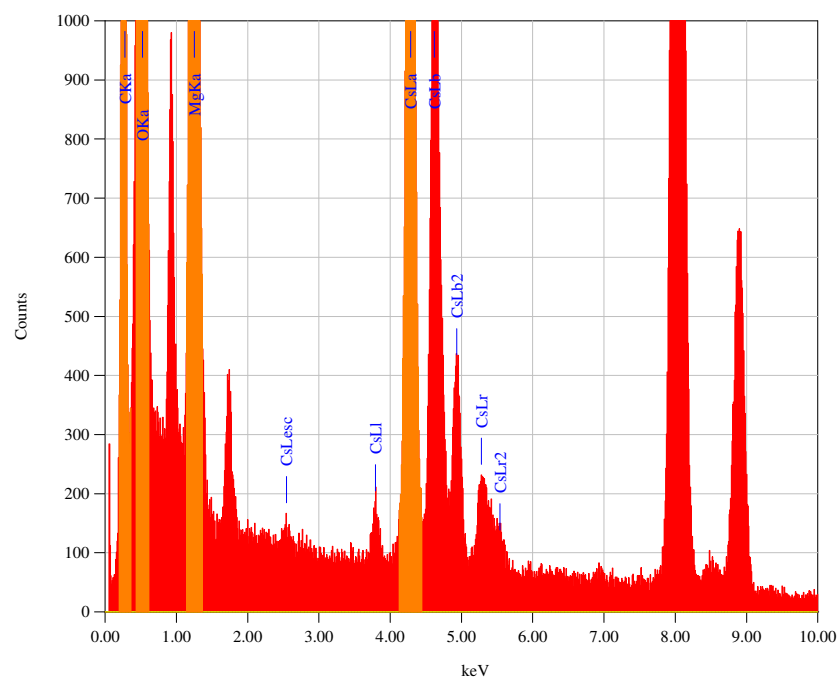
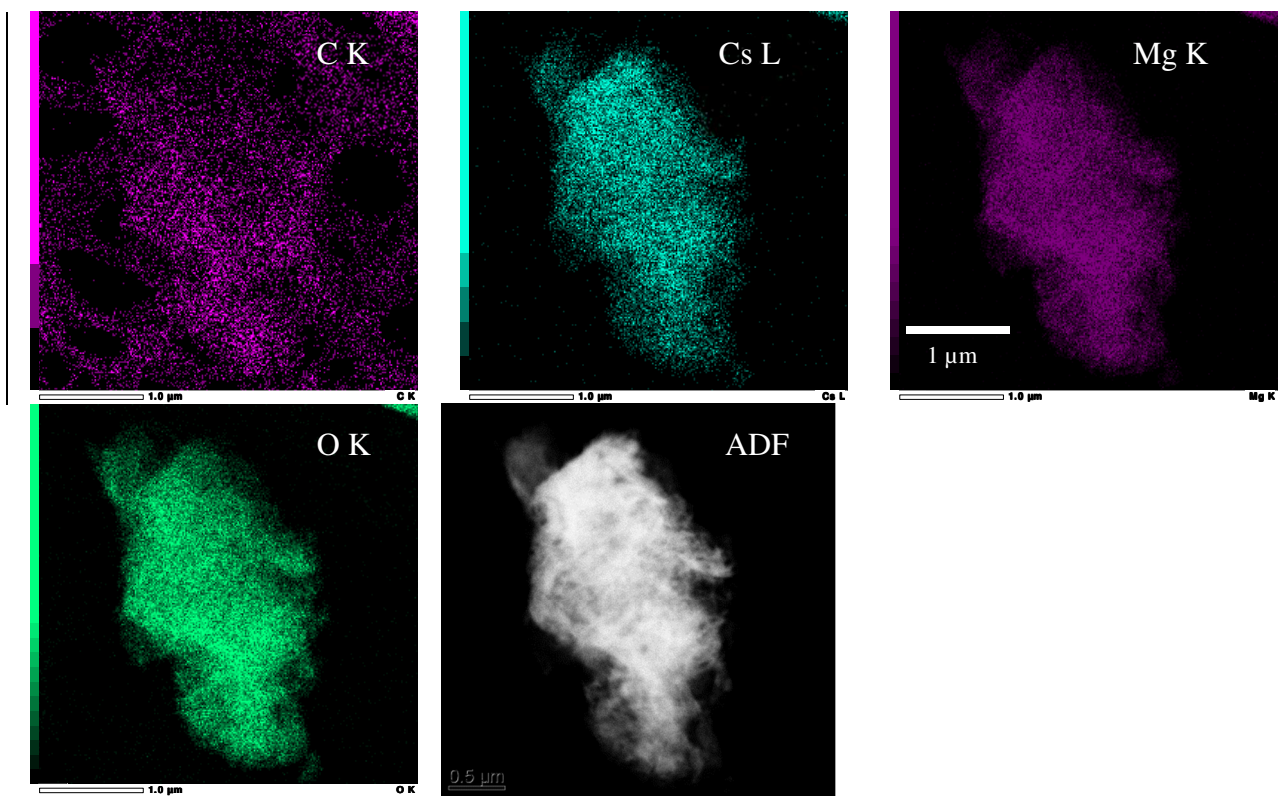
Figure B: Thermograms (cycle plots, 100 % mass at start of cycles, left) and full plots (100 % mass at start of experiment, right) for the MgO-Cs₂CO₃ materials

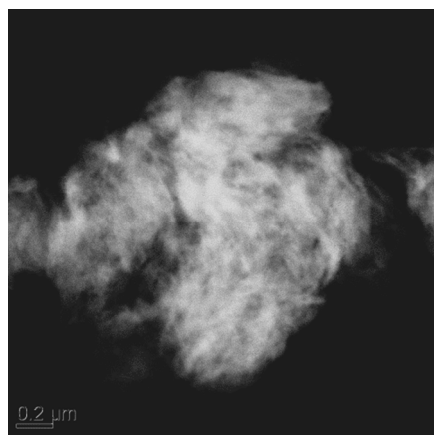
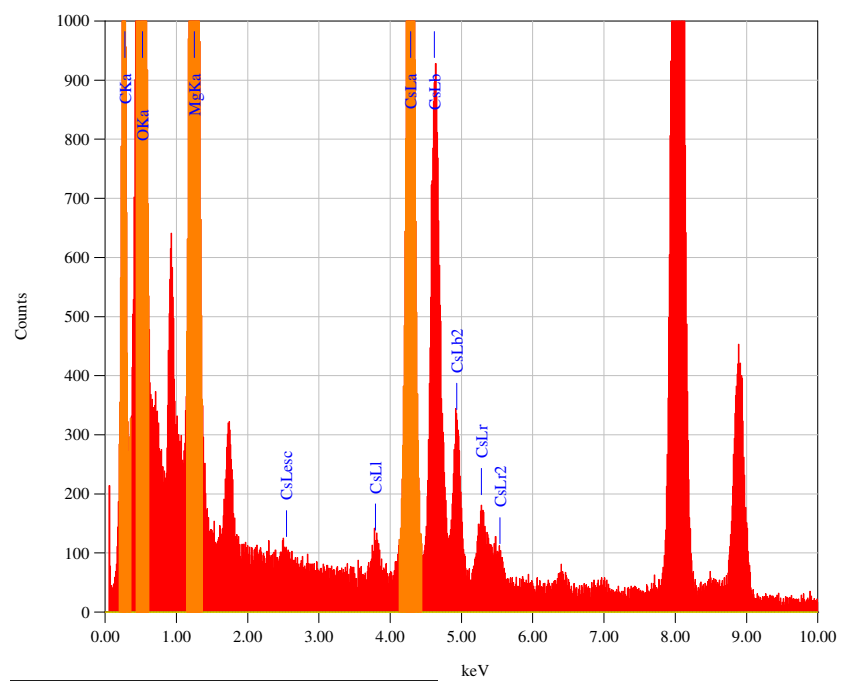
3 Energy dispersive X-ray spectra and additional elemental maps

The energy-dispersive X-ray (EDX) spectra confirmed the existence of the elements mapped in the samples (cesium, magnesium, carbon, oxygen) and are given here next to the dark-field images for recognition in the journal article. Additional elemental maps and their respective EDX spectra are shown in this section as well.

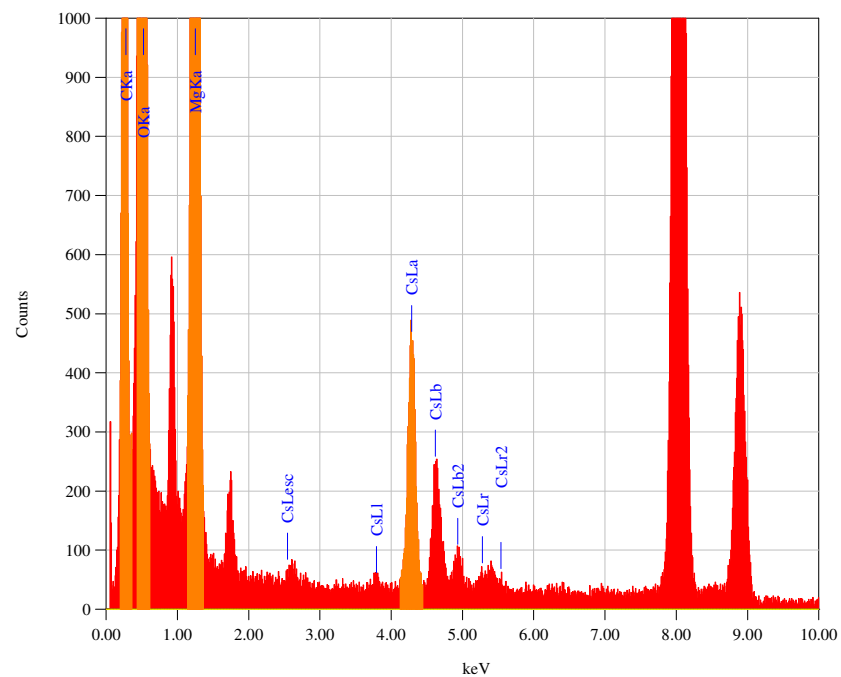
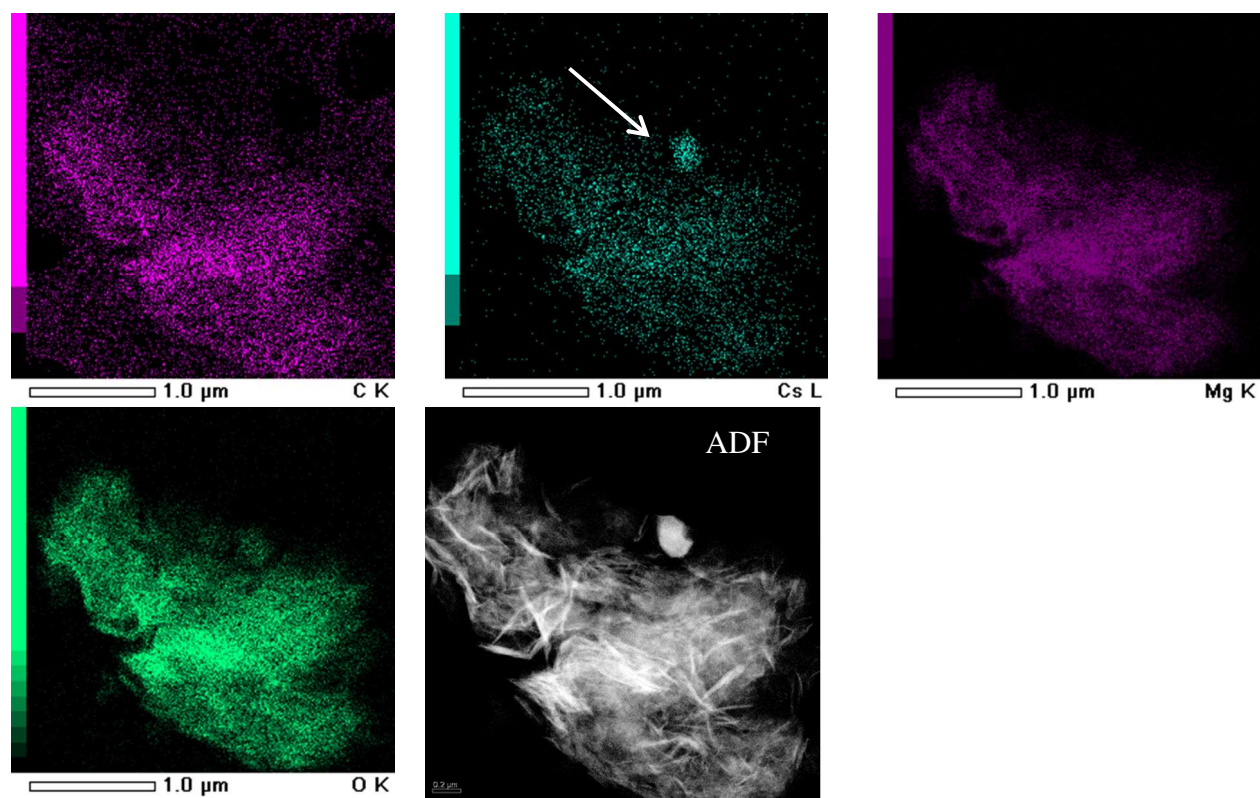
3.1 EDX spectra, dark field image and elemental maps of the nano-wet mix as synthesised sample.

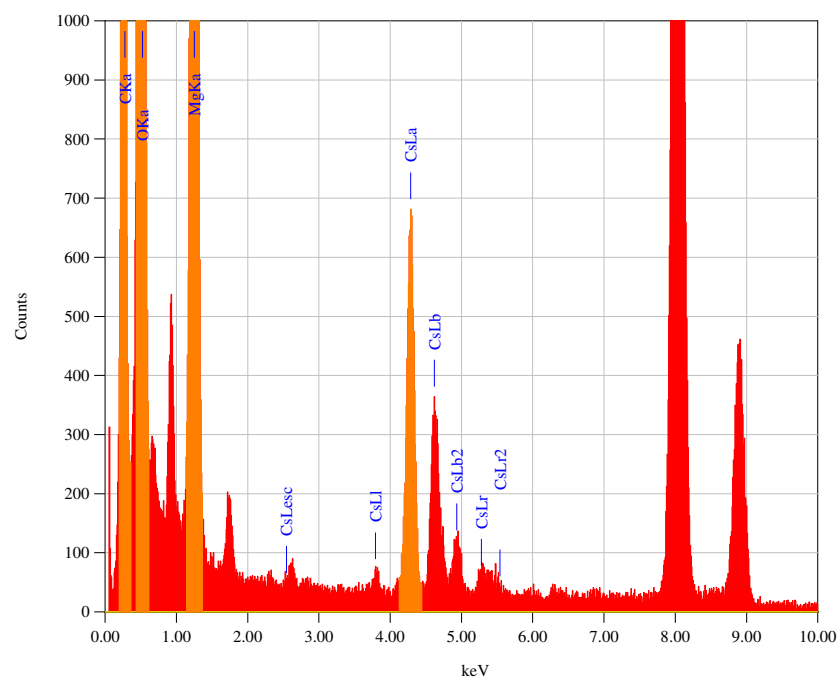
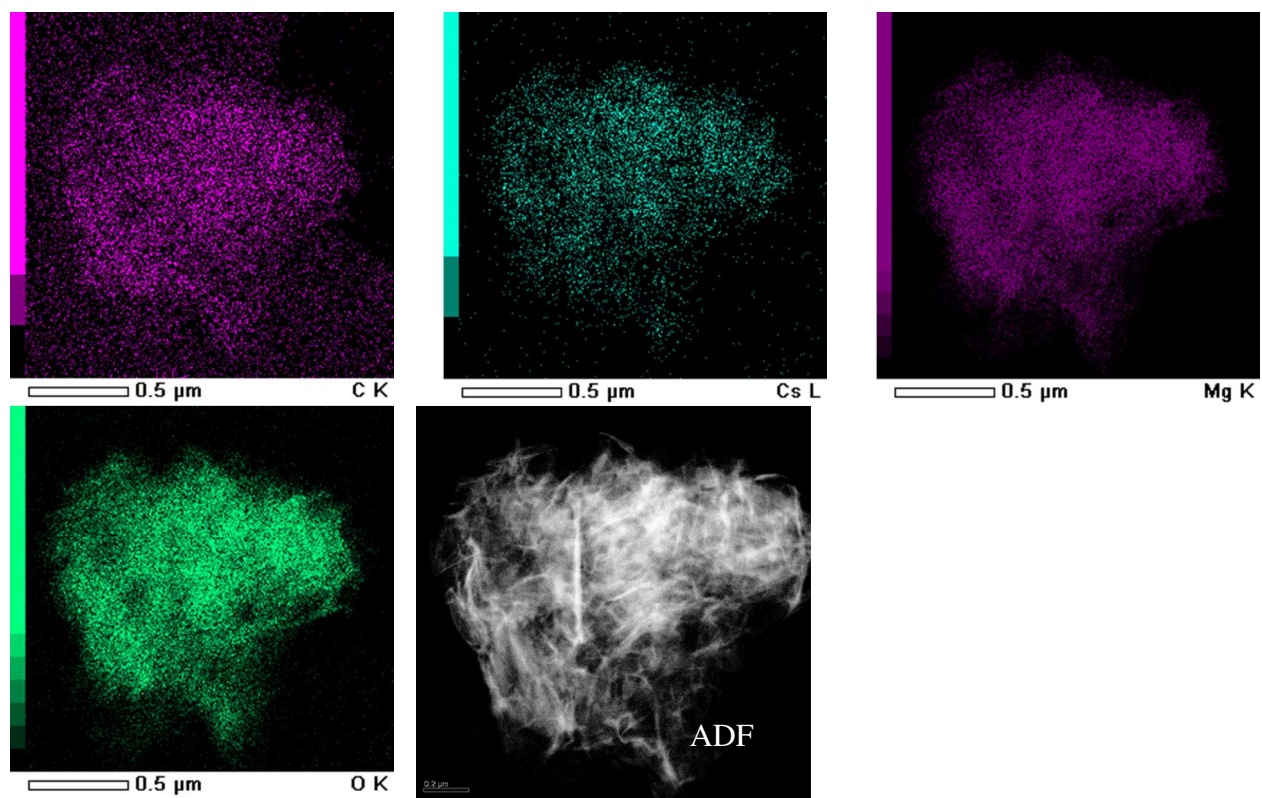


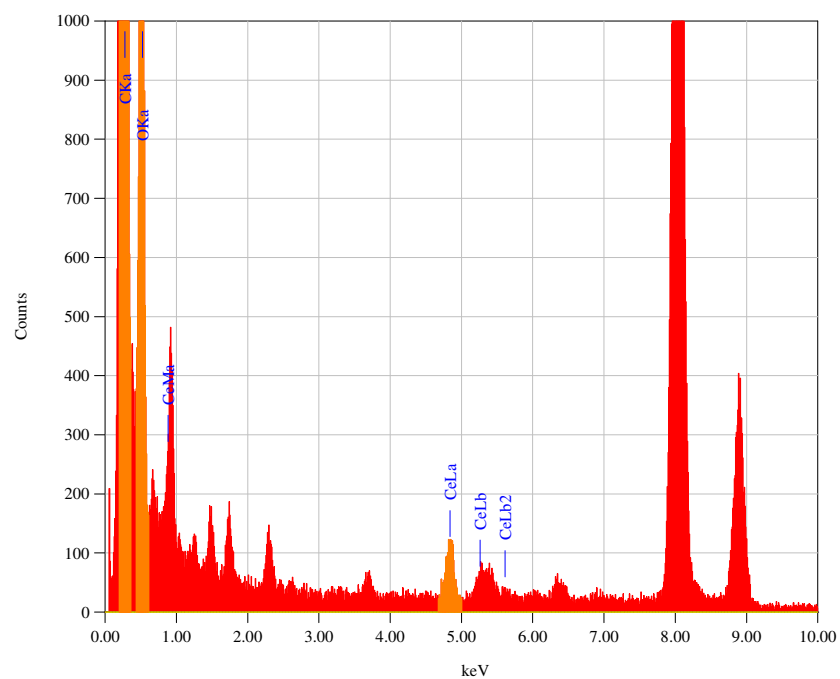




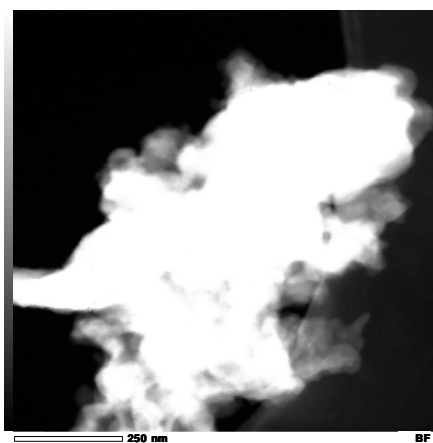
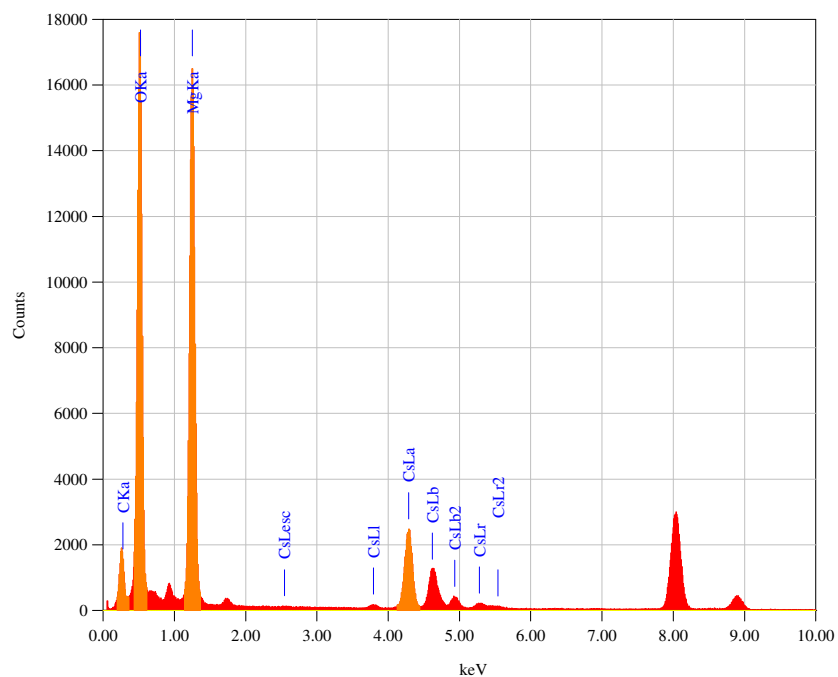
3.2 EDX spectra, dark field image and elemental maps of the nano-direct as synthesised sample







3.3 EDX spectrum and dark-field image of the elemental maps of the nano-wet mix carbonated sample.



3.4 EDX spectra, dark and bright-field images and elemental maps of the nano-direct carbonated sample.

