Supporting Information

Synthesis and Characterisation of A Ultrahigh Ion-Exchange Capacity Polymeric Membranes

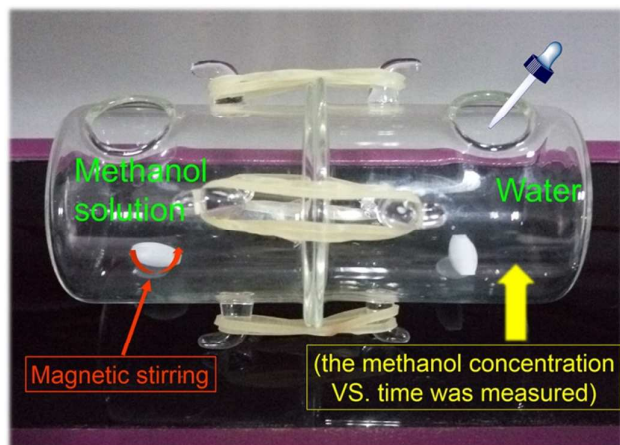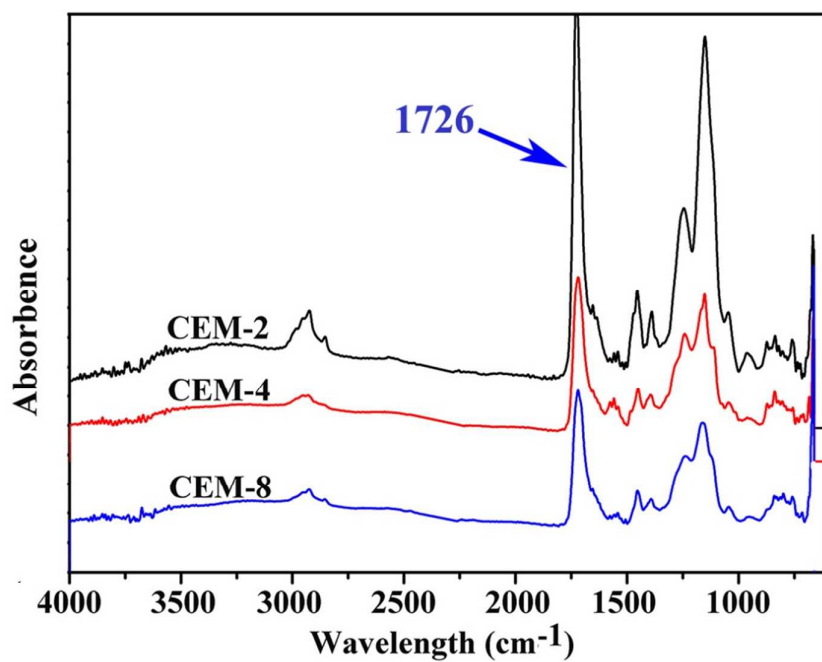*Weifeng Zhao[a,b], Chao He[a], Chuanxiong Nie[a], Shudong Sun[a*], Changsheng Zhao[a*]*

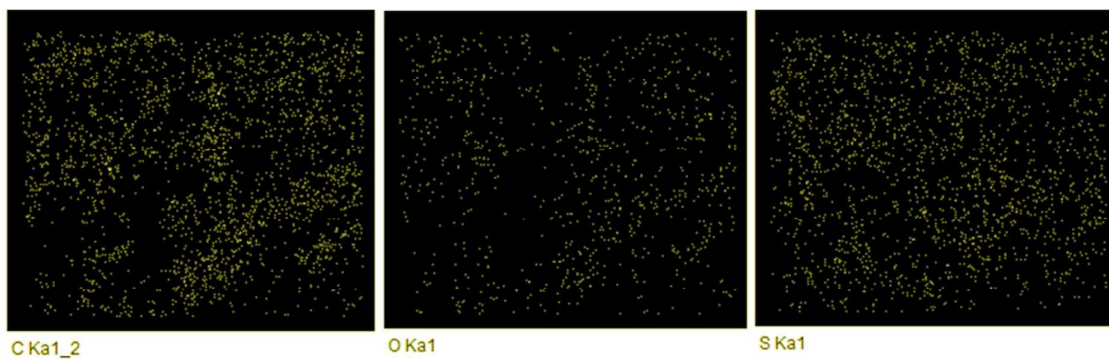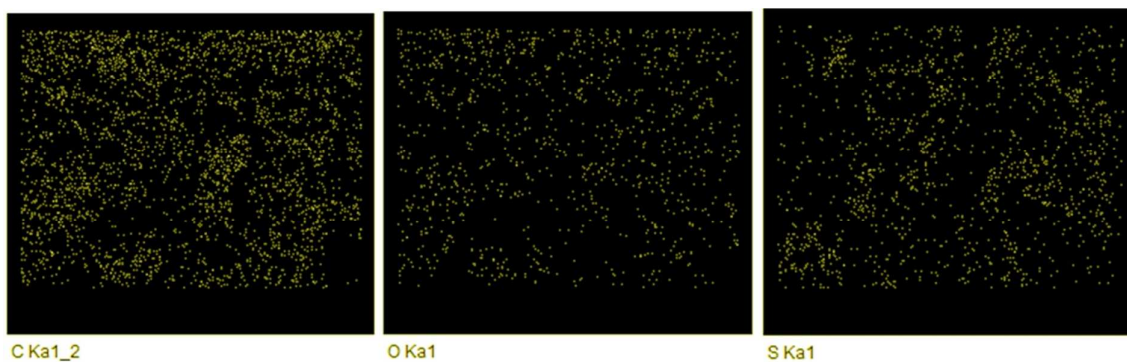**Figure S1.** Methanol permeability test cell.

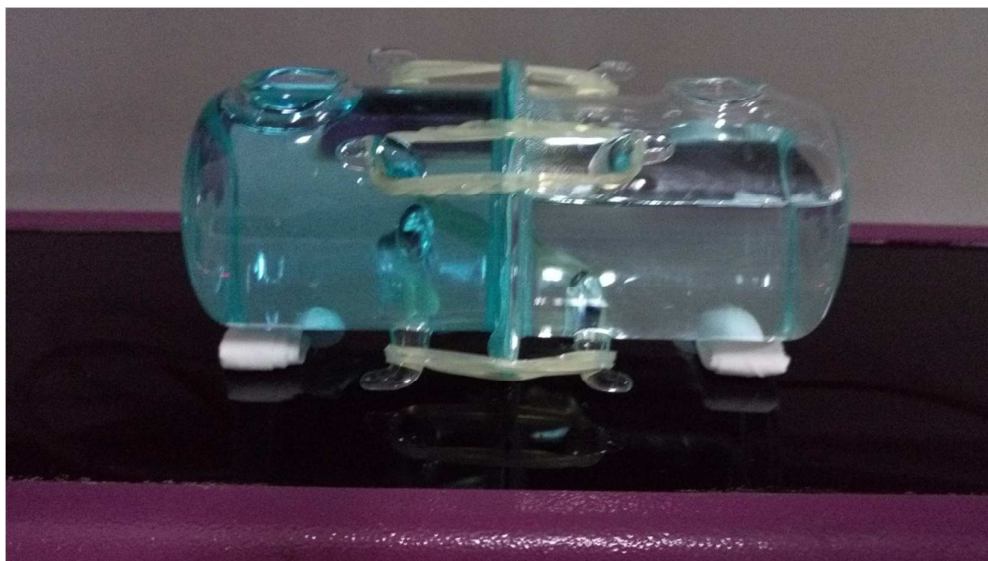**Figure S2.** ATR-FTIR of CEMs.

C Ka1_2

O Ka1

S Ka1

Figure S3. 2-demensional distribution of C, O and S in CEM-2.

C Ka1_2

O Ka1

S Ka1

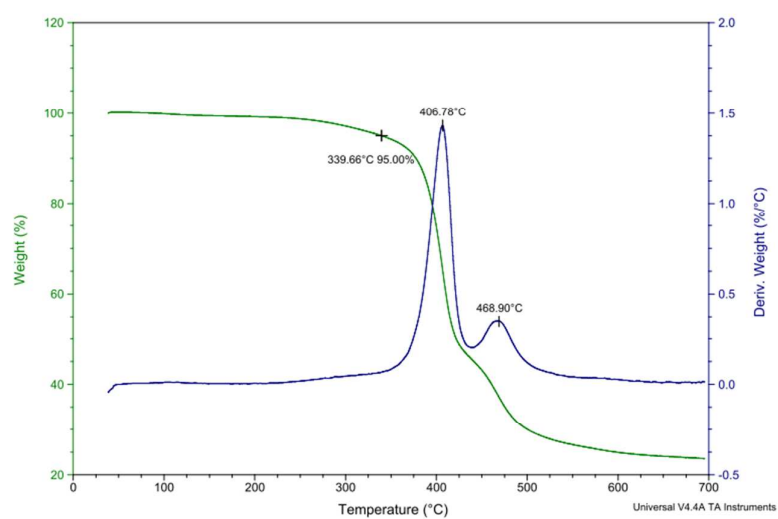**Figure S4** 2-demensional distribution of C, O and S in CEM-4.

C Ka1_2

O Ka1

S Ka1
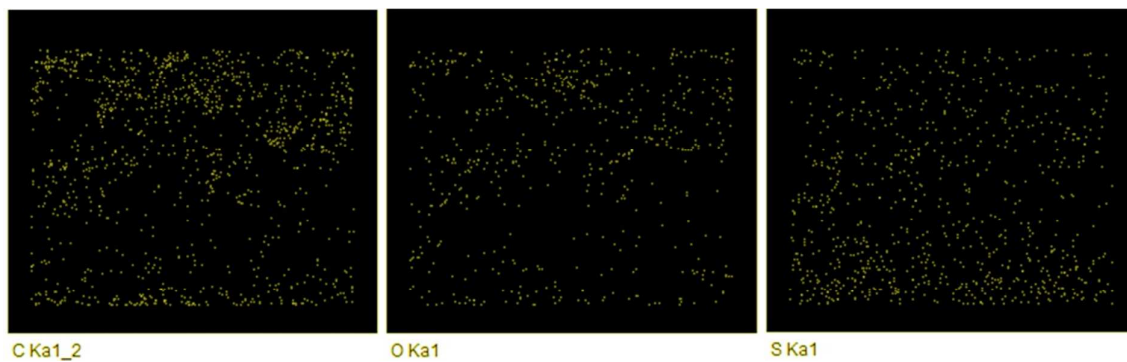
Figure S5. 2-demensional distribution of C, O and S in CEM-8.
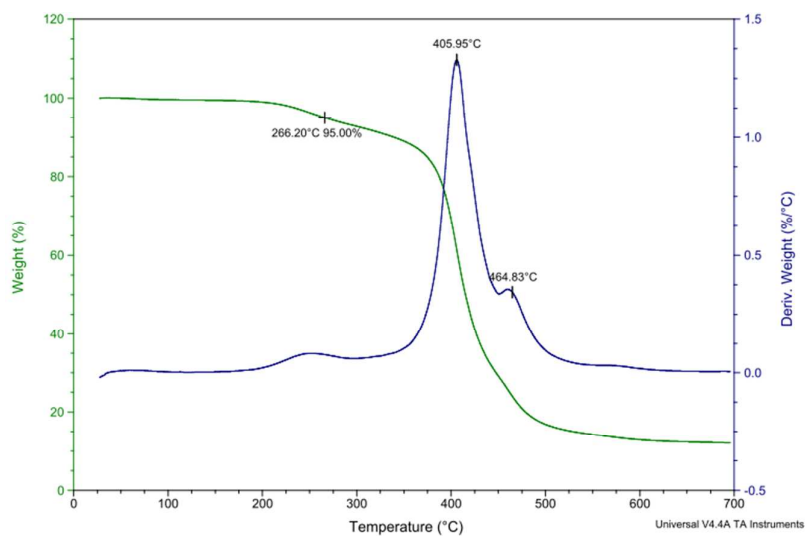
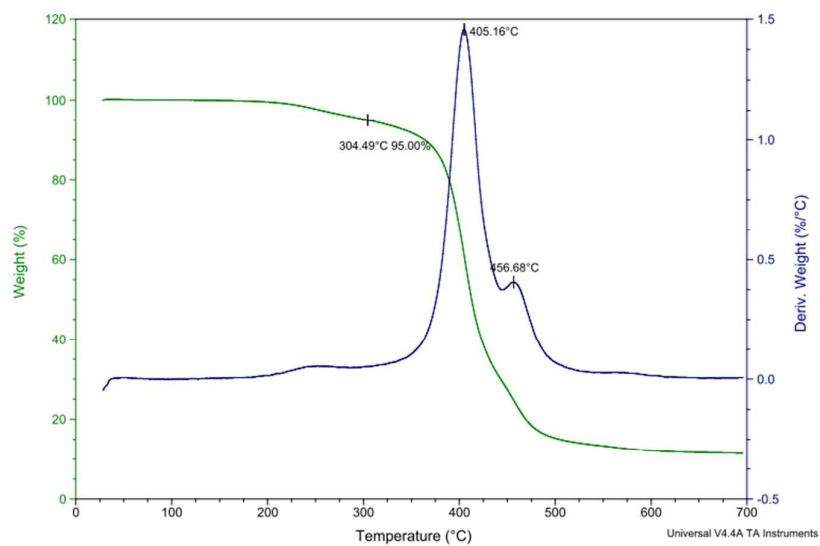**Figure S6.** The permeability test cells for Cu^{2+} after 24 h.

Figure S7. The CEM-8 after 24 h of Cu^{2+} permeability test.
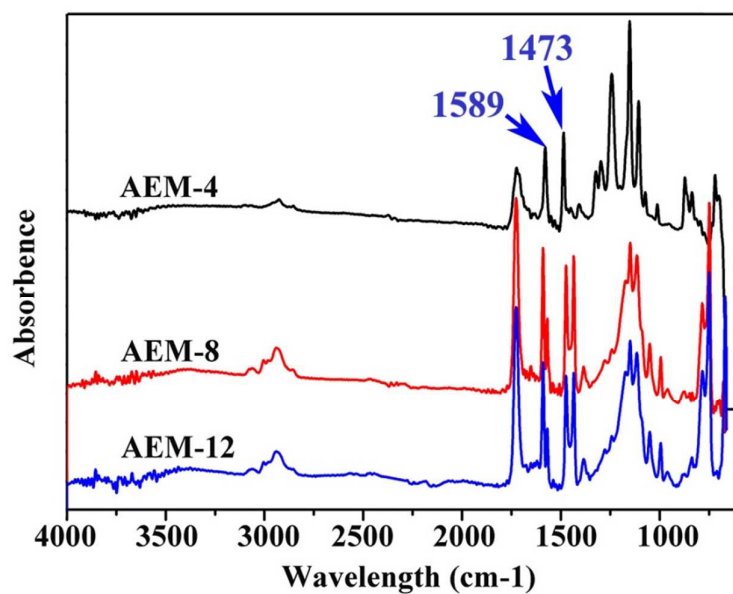

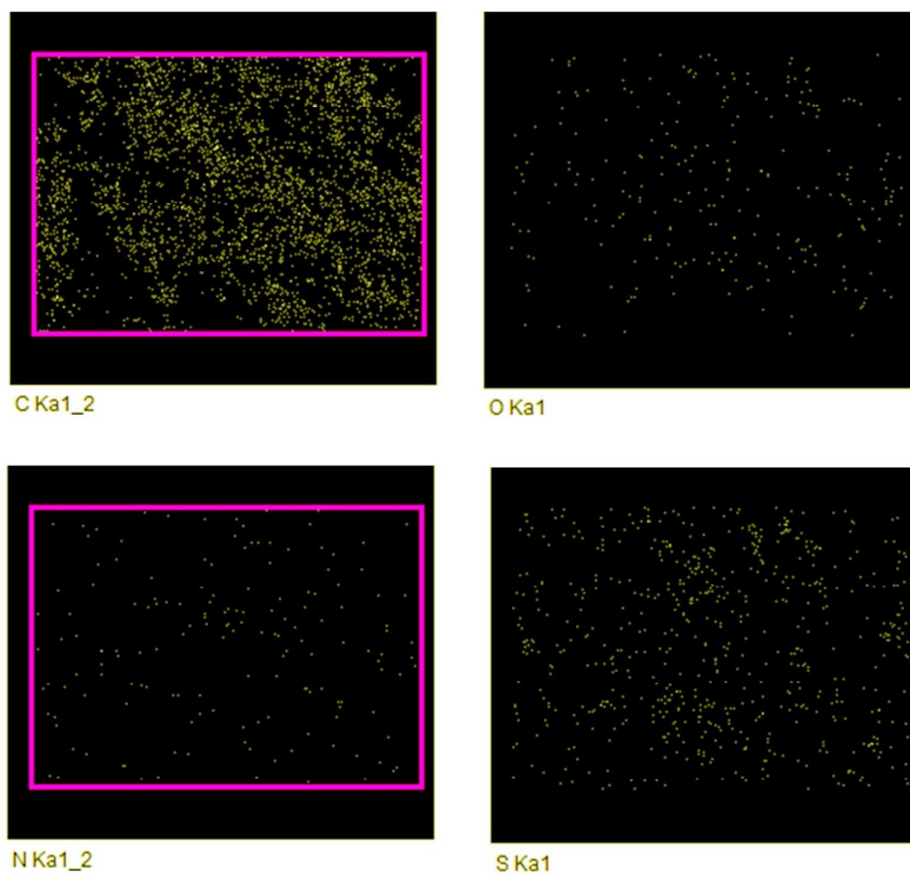**Figure S8.** TGA and DTG curves for CEM-2.

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Figure S9. TGA and DTG curves for CEM-4.

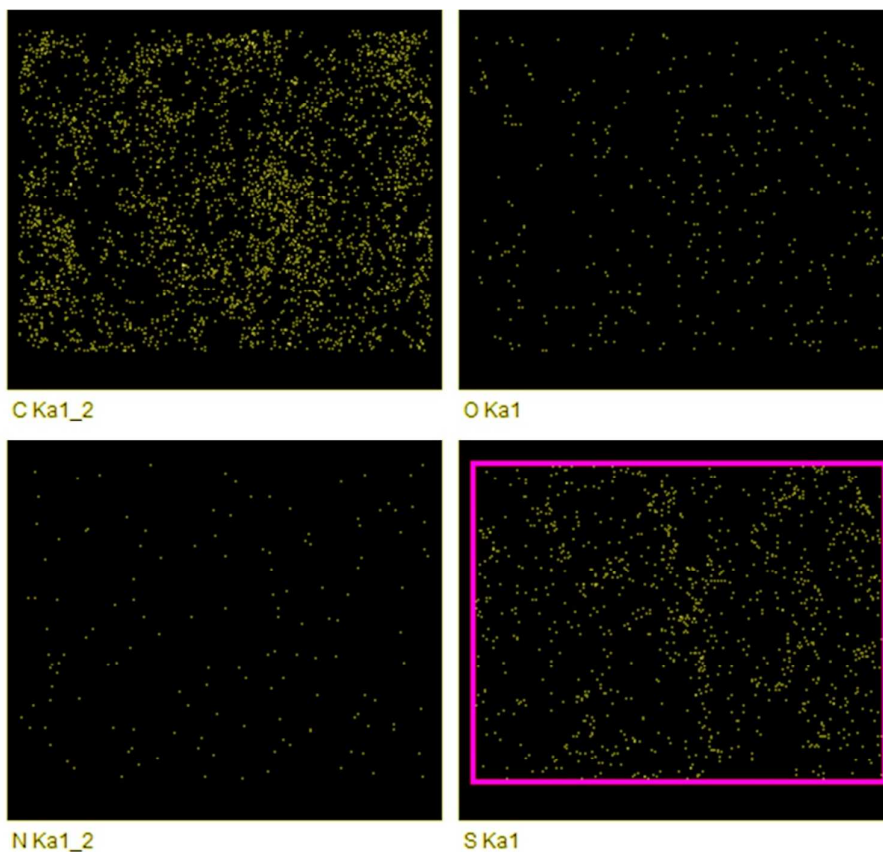**Figure S10.** TGA and DTG curves for CEM-8.
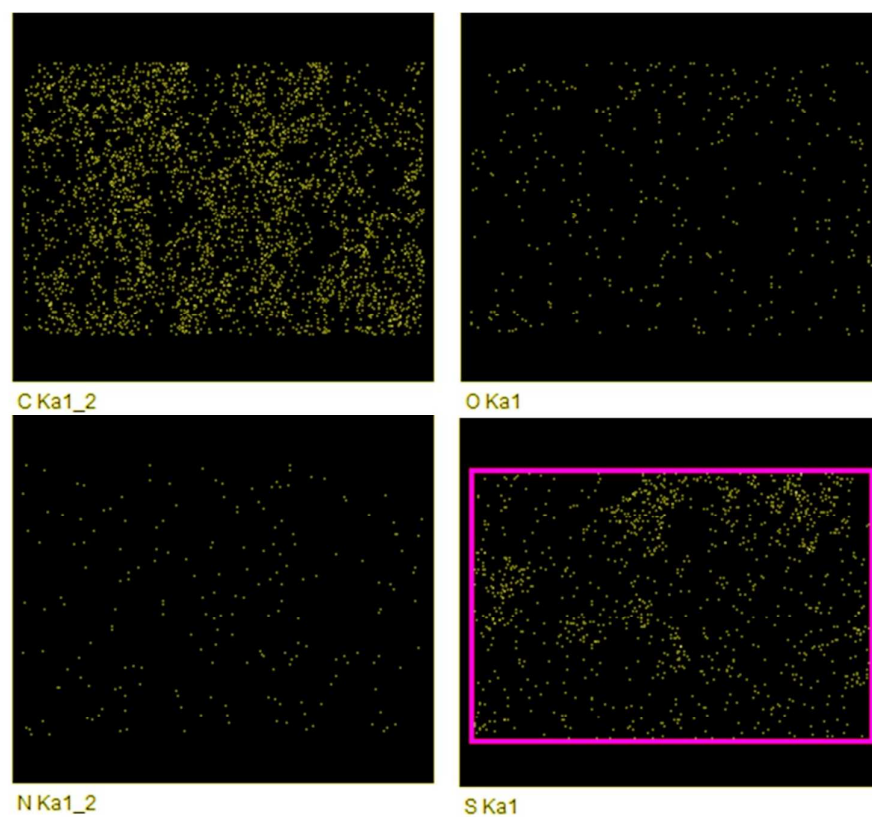
Figure S11 ATR-FTIR of AEMs.

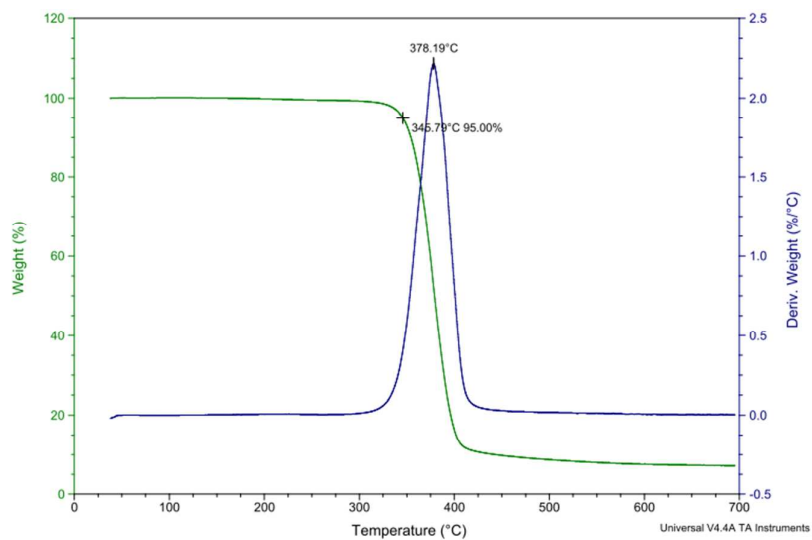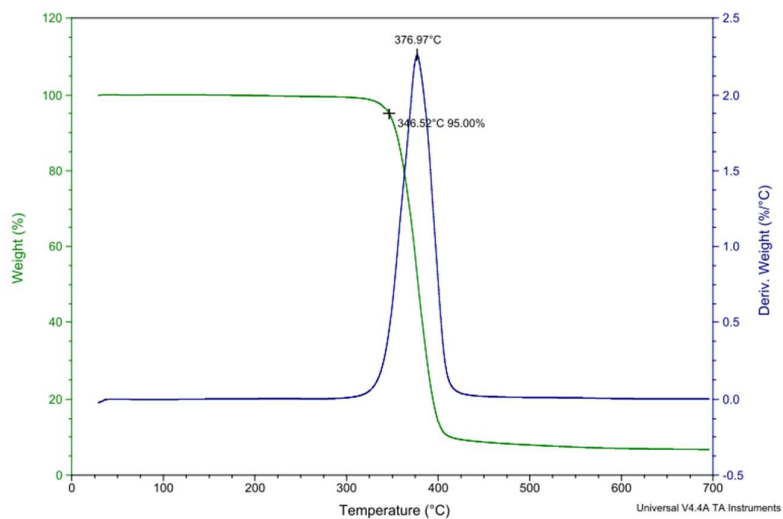**Figure S12.** 2-demensional distribution of C, O, N and S in AEM-4.

C Ka1_2

O Ka1

N Ka1_2

S Ka1

Figure S13. 2-demensional distribution of C, O, N and S in AEM-8.

C Ka1_2
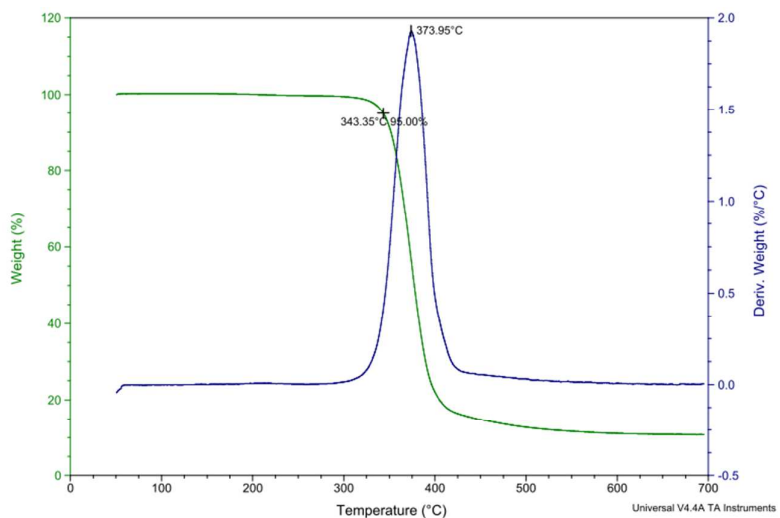
O Ka1

N Ka1_2

S Ka1

Figure S14. 2-demensional distribution of C, O, N and S in AEM-12.

Figure S15. TGA and DTG of AEM-4.

Figure S16. TGA and DTG of AEM-8.

Figure S17. TGA and DTG of AEM-12.