Electronic Supplementary Information for:

Detoxification of Bisphenol A-Containing Wastes and Sustainable Portland Cement Alternatives via Carbon–Carbon σ-Bond Scission upon reaction with Elemental Sulfur

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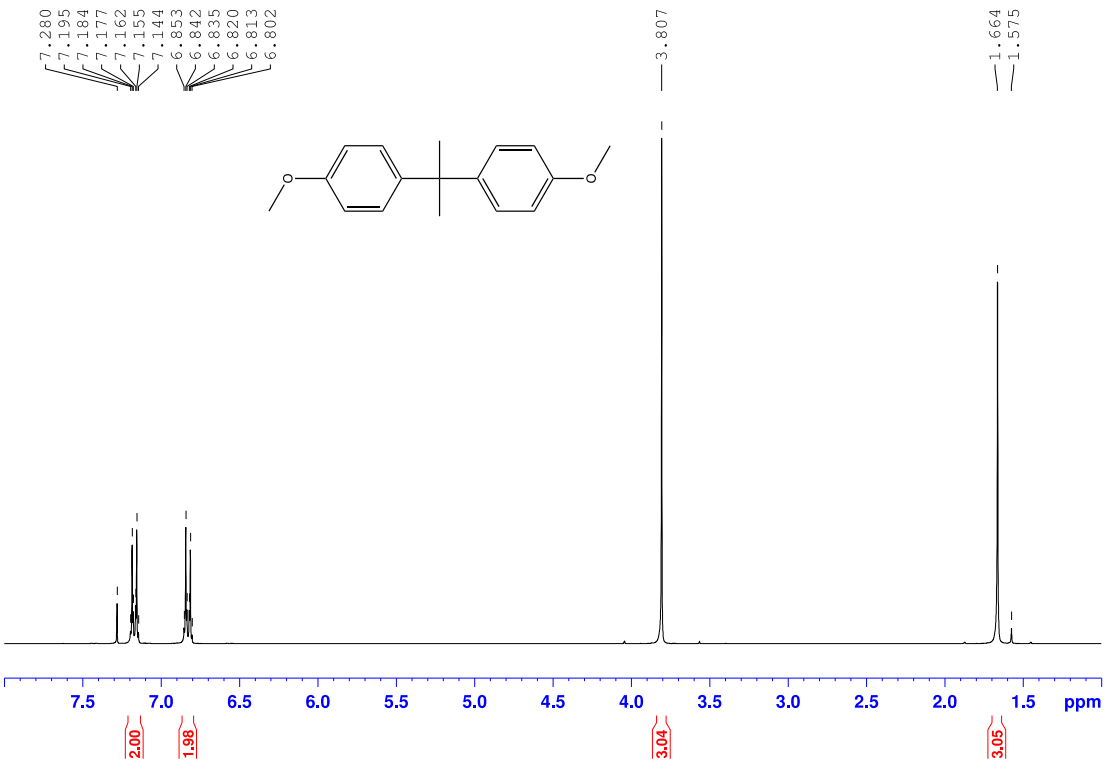

Figure S1. Proton NMR spectrum of *O*, *O*'-dimethyl bisphenol A (**DMBPA**, $CDCl_3$, 300 MHz). Solvent and water residual signals are labelled.

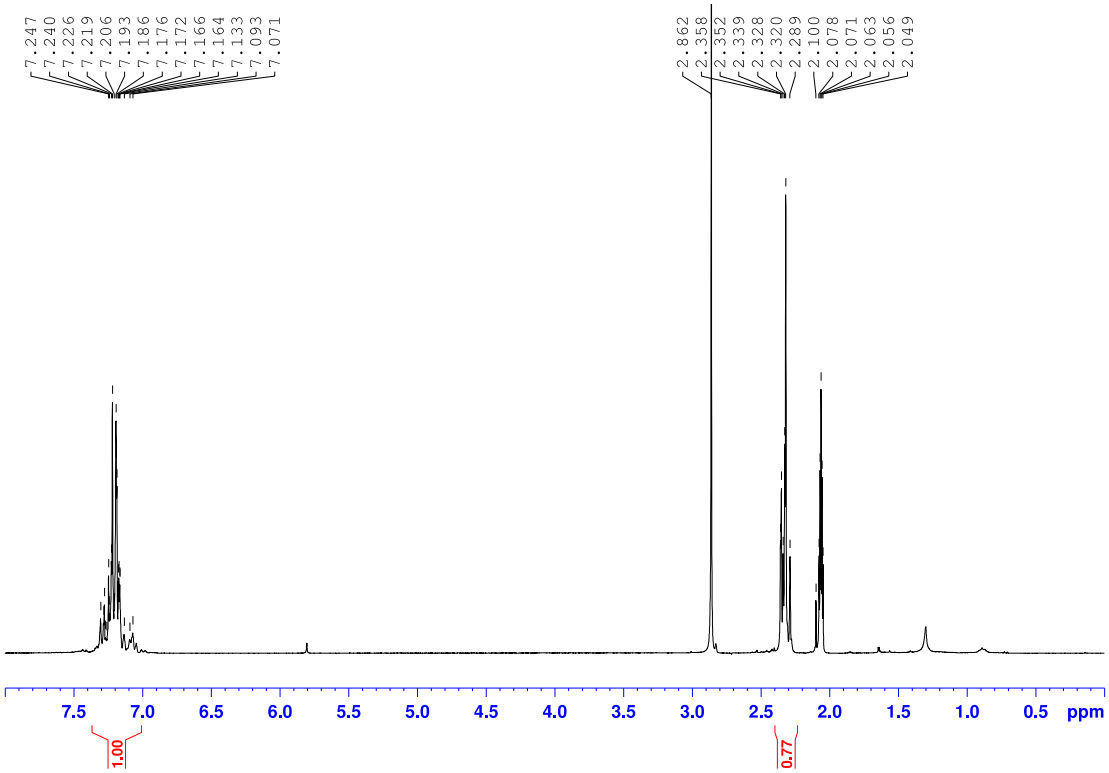

Figure S2. Proton NMR spectrum for the product mixture resulting from $AlBr_3$-mediated depolymerization of **BC90** (acetone-d^6, 300 MHz). Solvent and water residual signals are labelled.

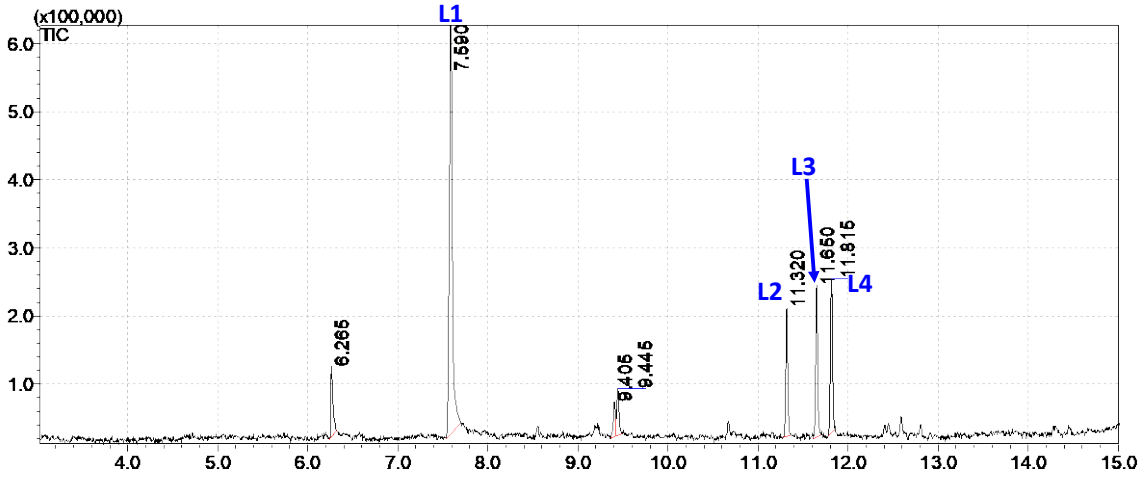

Figure S3. Inset of the Gas chromatogram of acetylated $AlBr_3$-depolymerization products.

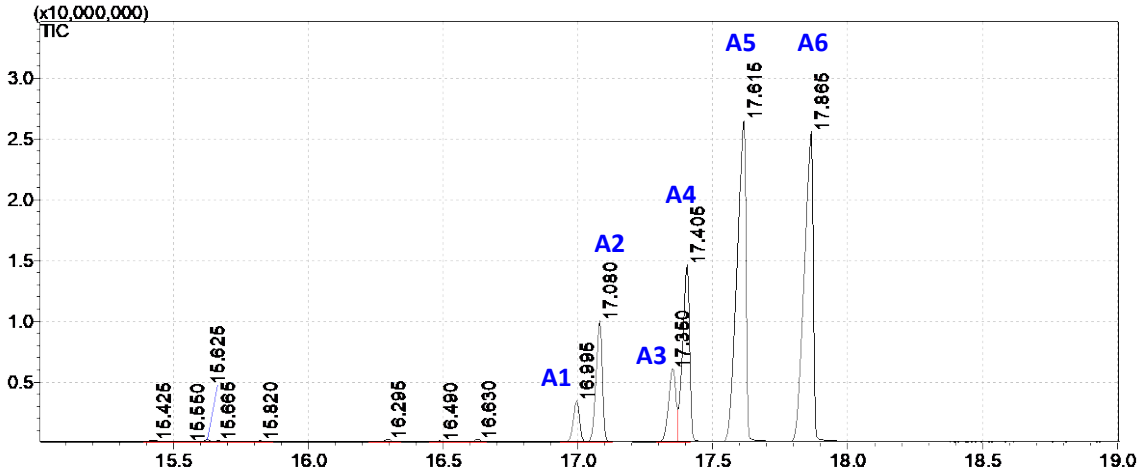

Figure S4. Inset of the Gas chromatogram of acetylated $AlBr_3$-depolymerization products.

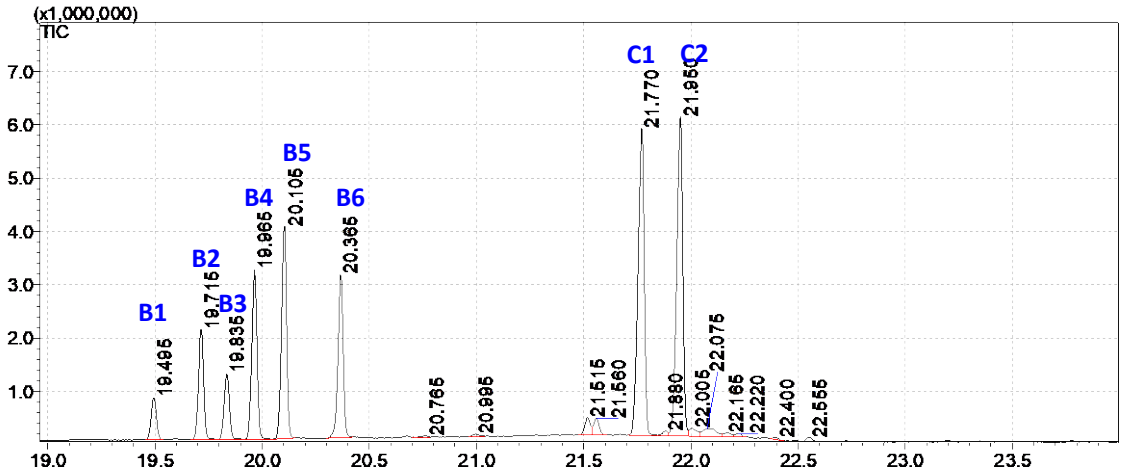

Figure S5. Inset of the Gas chromatogram of acetylated $AlBr_3$-depolymerization products.

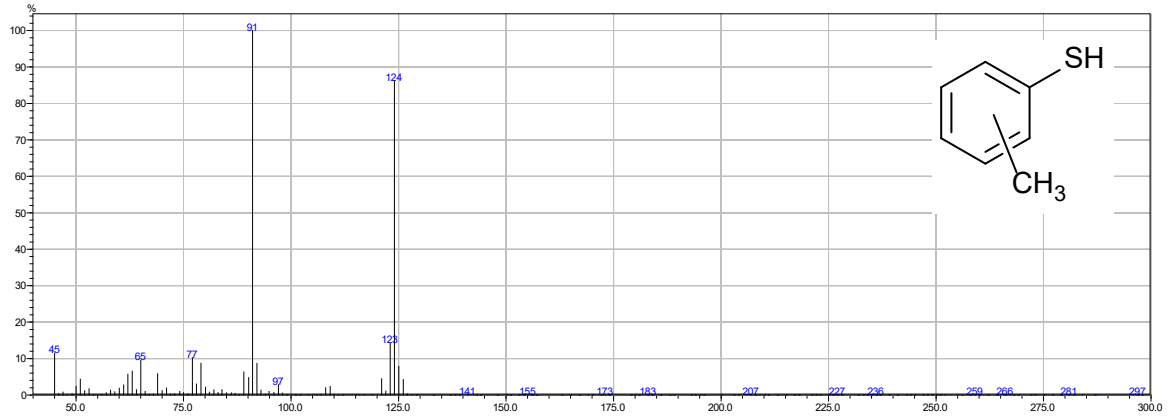

Figure S6. Mass spectrum corresponding to the retention time (7.590 min) for peak labelled L1 in Figure S3 and associated structural assignment information.

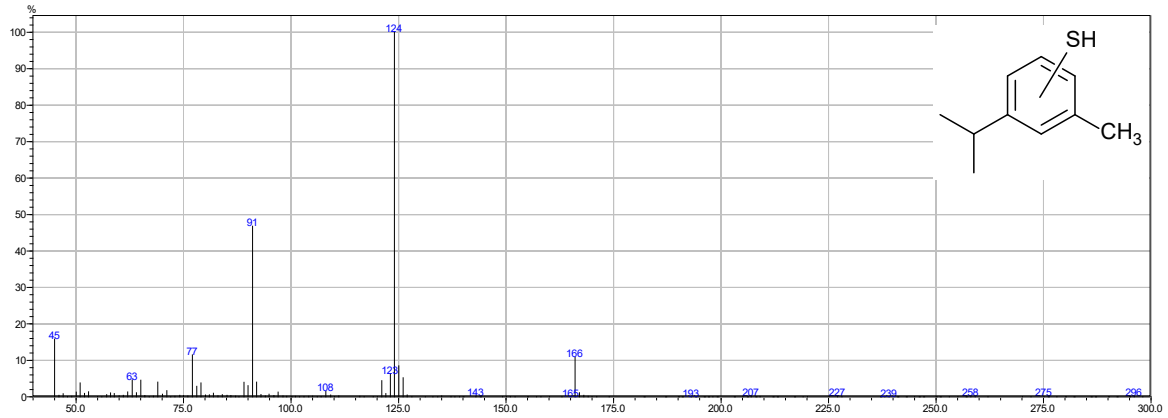

Figure S7. Mass spectrum corresponding to the retention time (11.320 min) for peak labelled L2 in Figure S3 and associated structural assignment information.

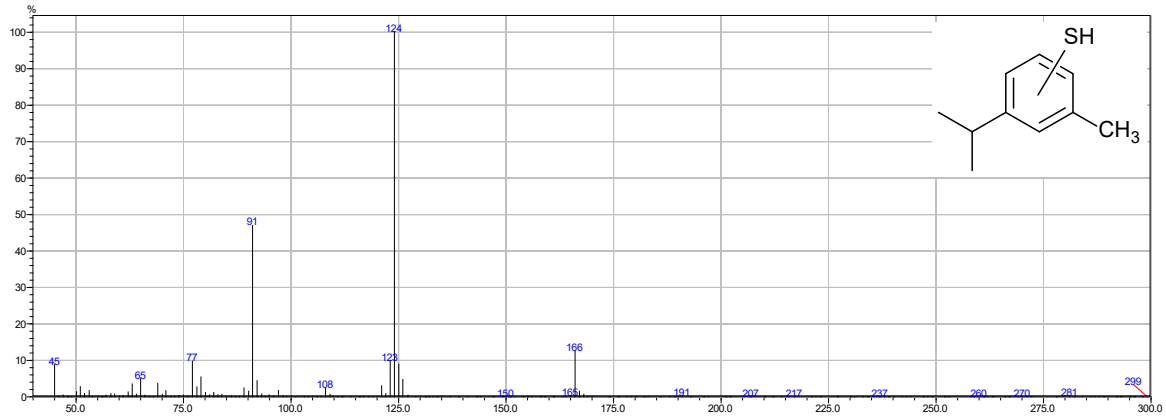

Figure S8. Mass spectrum corresponding to the retention time (11.650 min) for peak labelled L3 in Figure S3 and associated structural assignment information.

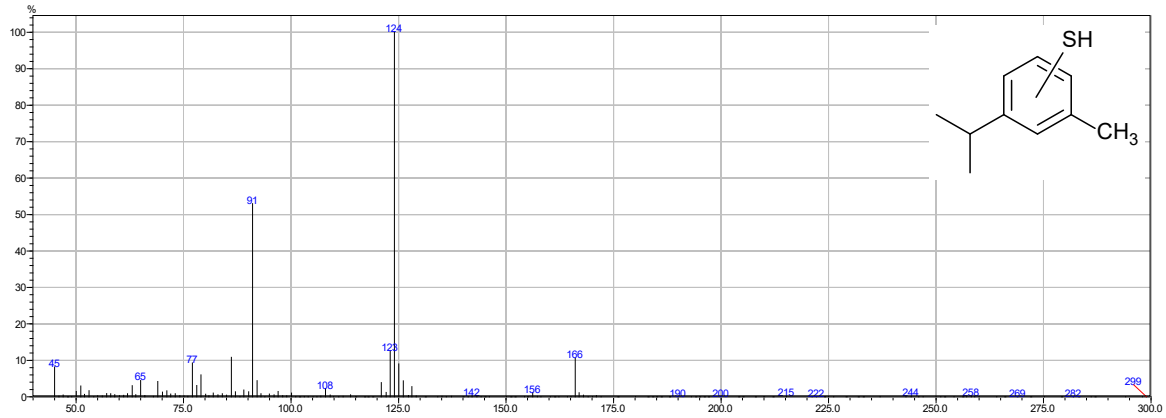

Figure S9. Mass spectrum corresponding to the retention time (11.815 min) for peak labelled L4 in Figure S3 and associated structural assignment information.

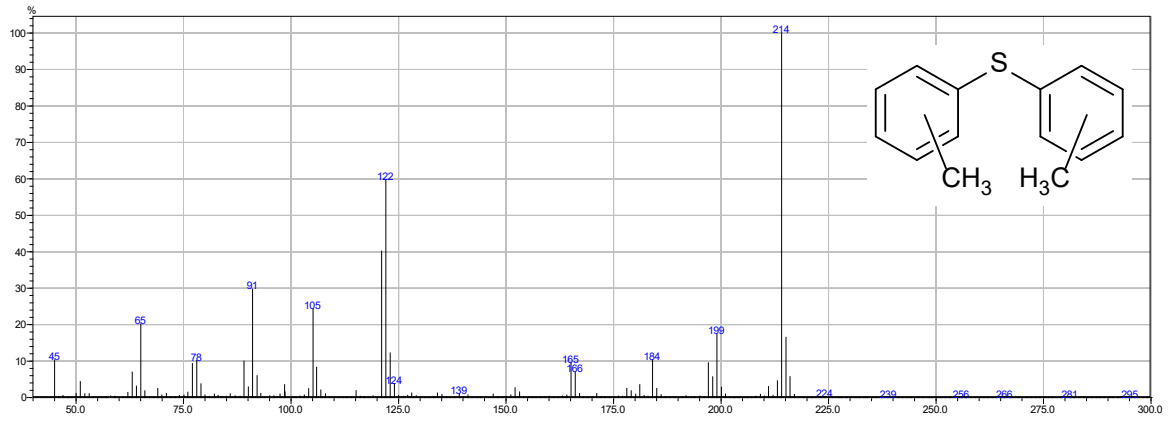

Figure S10. Mass spectrum corresponding to the retention time (16.995 min) for peak labelled A1 in Figure S4 and associated structural assignment information.

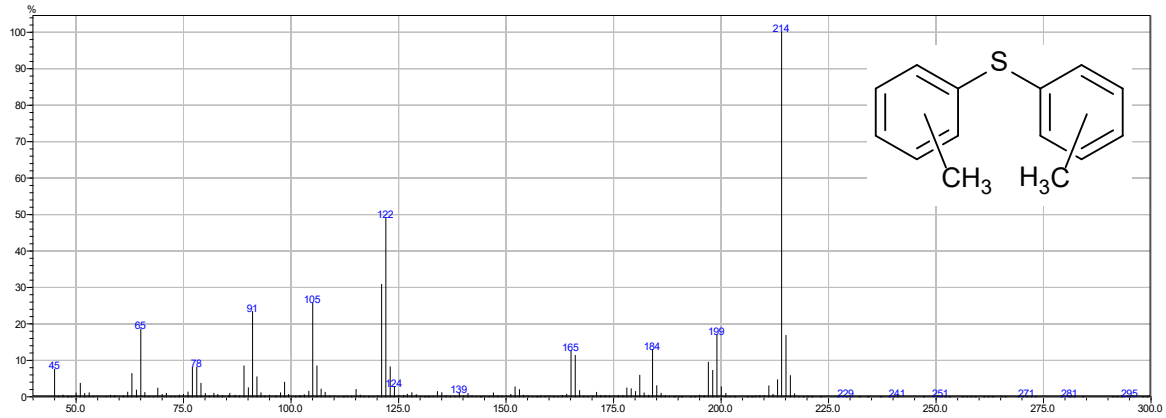

Figure S11. Mass spectrum corresponding to the retention time (17.080 min) for peak labelled A2 in Figure S4 and associated structural assignment information.

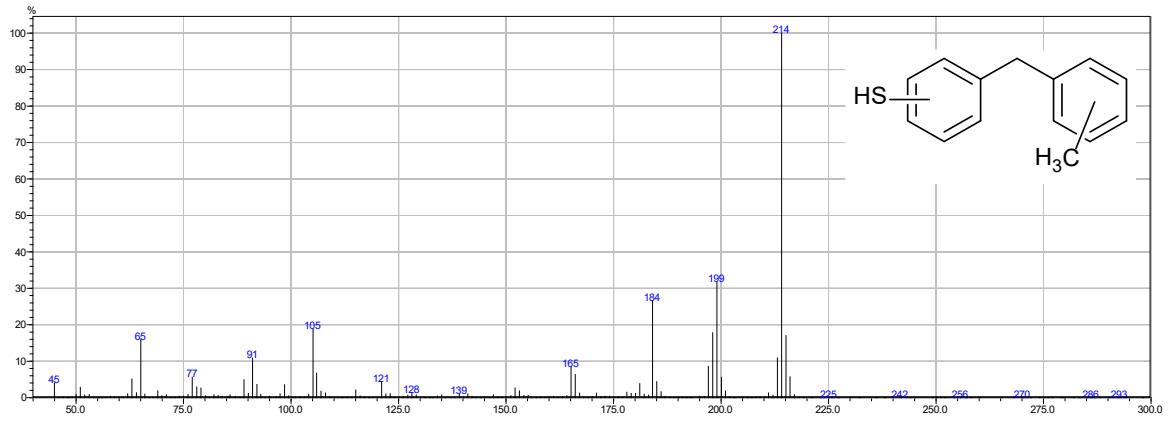

Figure S12. Mass spectrum corresponding to the retention time (17.350 min) for peak labelled A3 in Figure S4 and associated structural assignment information.

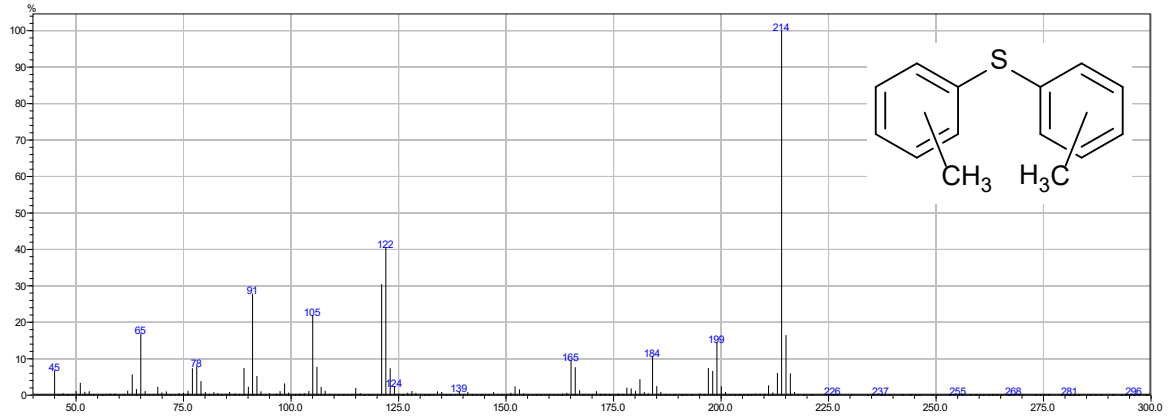

Figure S13. Mass spectrum corresponding to the retention time (17.405 min) for peak labelled A4 in Figure S4 and associated structural assignment information.

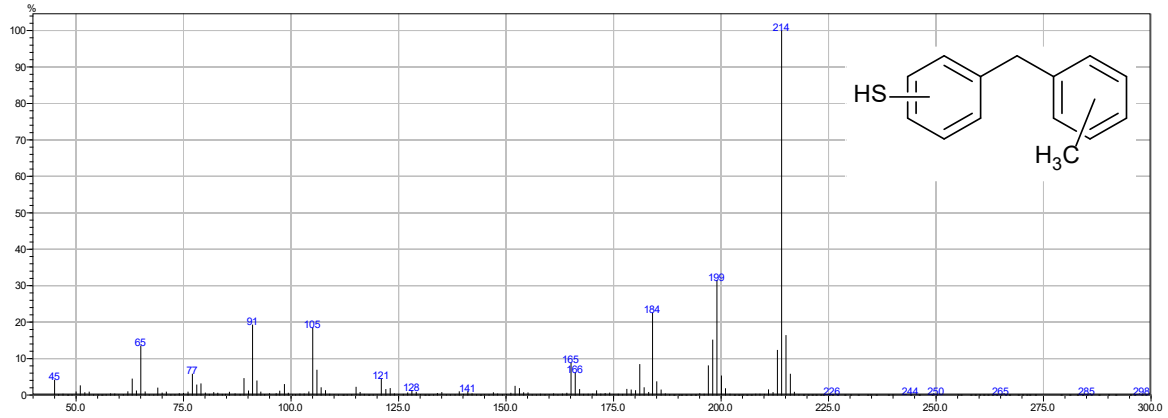

Figure S14. Mass spectrum corresponding to the retention time (17.615 min) for peak labelled A5 in Figure S4 and associated structural assignment information.

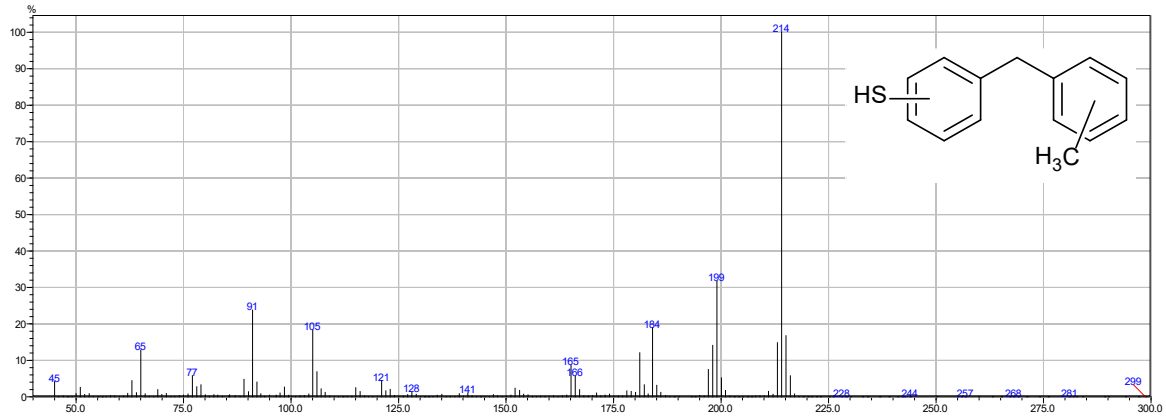

Figure S15. Mass spectrum corresponding to the retention time (17.865 min) for peak labelled A6 in Figure S4 and associated structural assignment information.

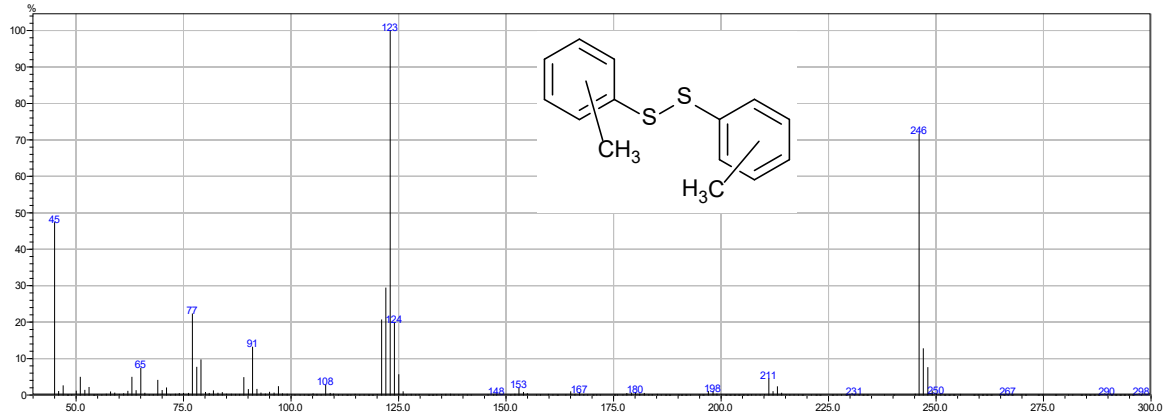

Figure S16. Mass spectrum corresponding to the retention time (19.495 min) for peak labelled B1 in Figure S5 and associated structural assignment information.

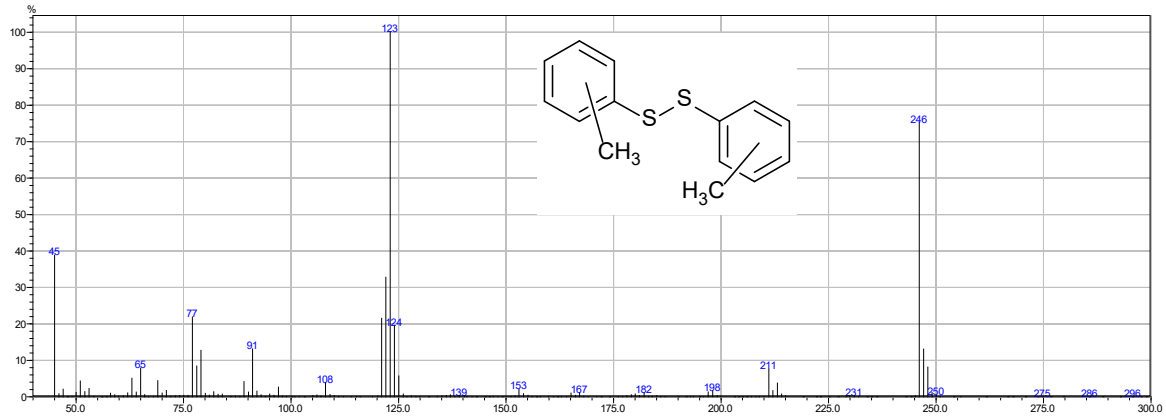

Figure S17. Mass spectrum corresponding to the retention time (19.715 min) for peak labelled B2 in Figure S5 and associated structural assignment information.

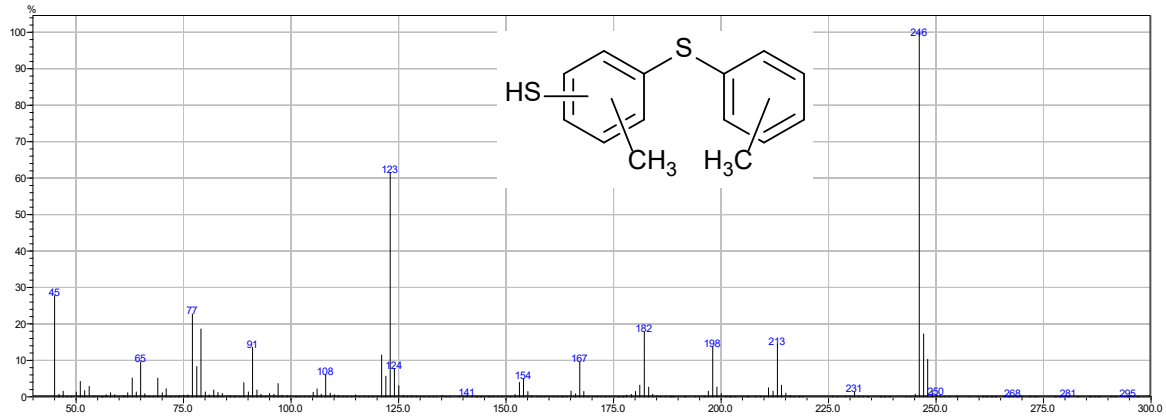

Figure S18. Mass spectrum corresponding to the retention time (19.835 min) for peak labelled B3 in Figure S5 and associated structural assignment information.

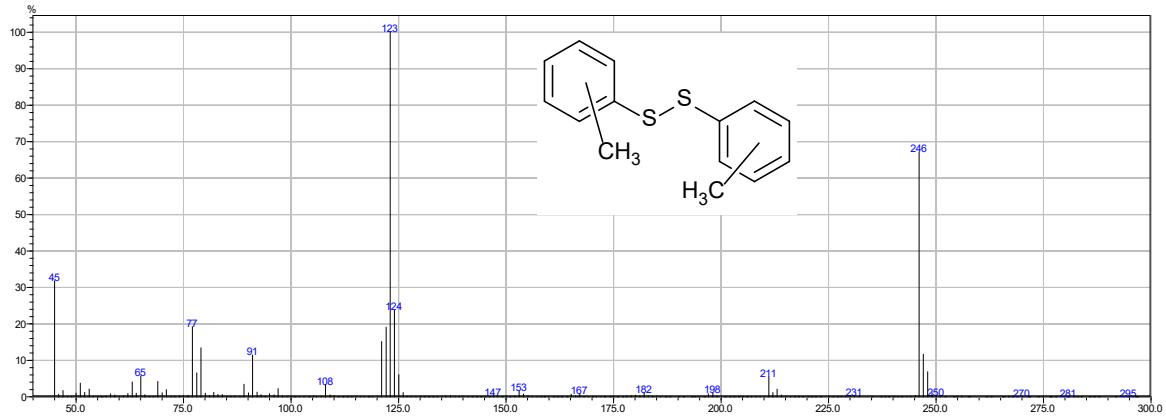

Figure S19. Mass spectrum corresponding to the retention time (19.965 min) for peak labelled B4 in Figure S5 and associated structural assignment information.

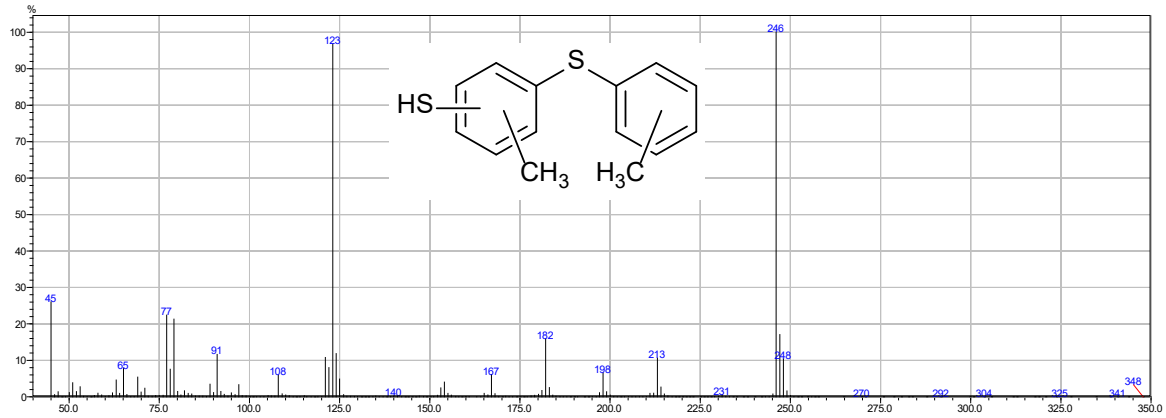

Figure S20. Mass spectrum corresponding to the retention time (20.105 min) for peak labelled B5 in Figure S5 and associated structural assignment information.

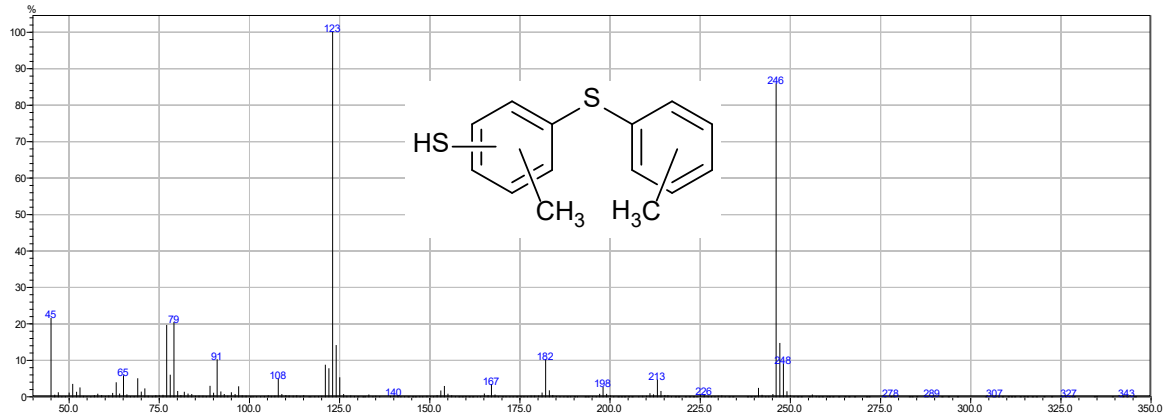

Figure S21. Mass spectrum corresponding to the retention time (20.365 min) for peak labelled B6 in Figure S5 and associated structural assignment information.

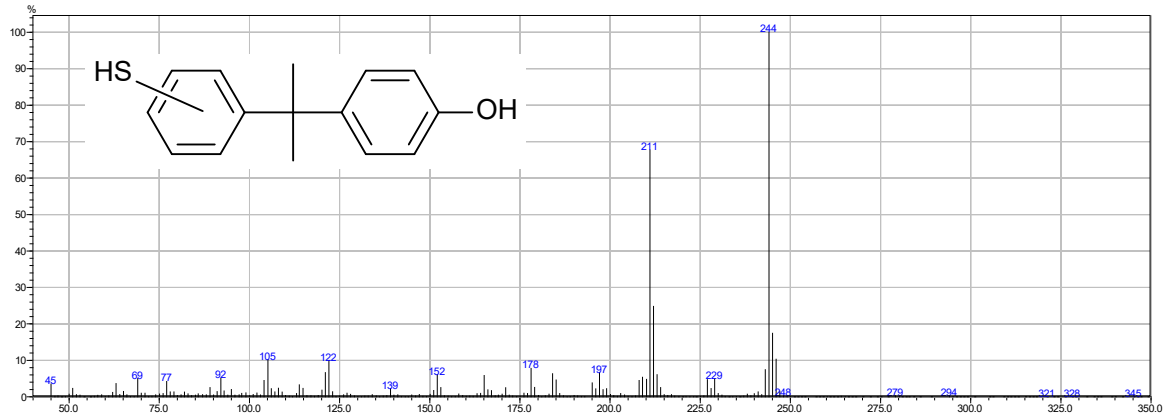

Figure S22. Mass spectrum corresponding to the retention time (21.770 min) for peak labelled C1 in Figure S5 and associated structural assignment information.

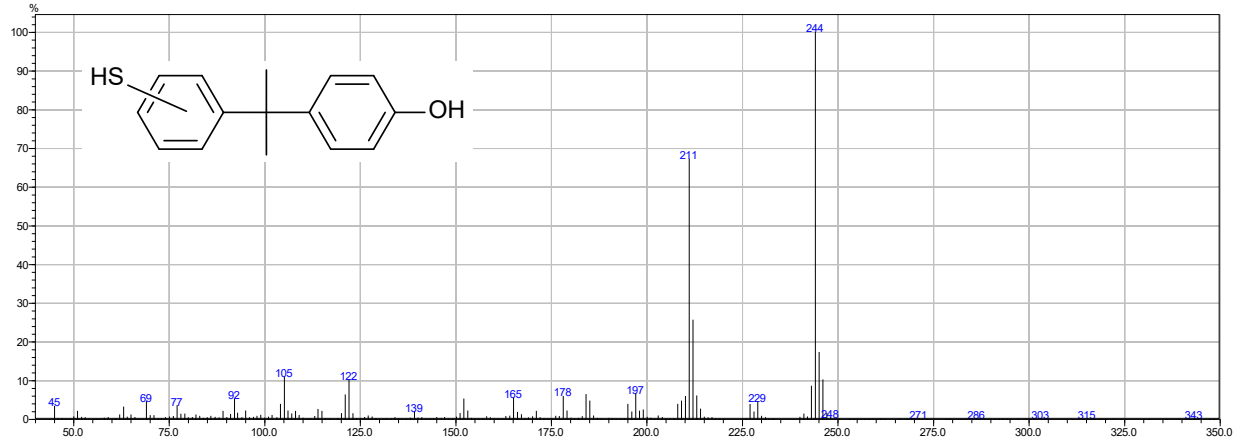

Figure S23. Mass spectrum corresponding to the retention time (21.950 min) for peak labelled C2 in Figure S5 and associated structural assignment information.

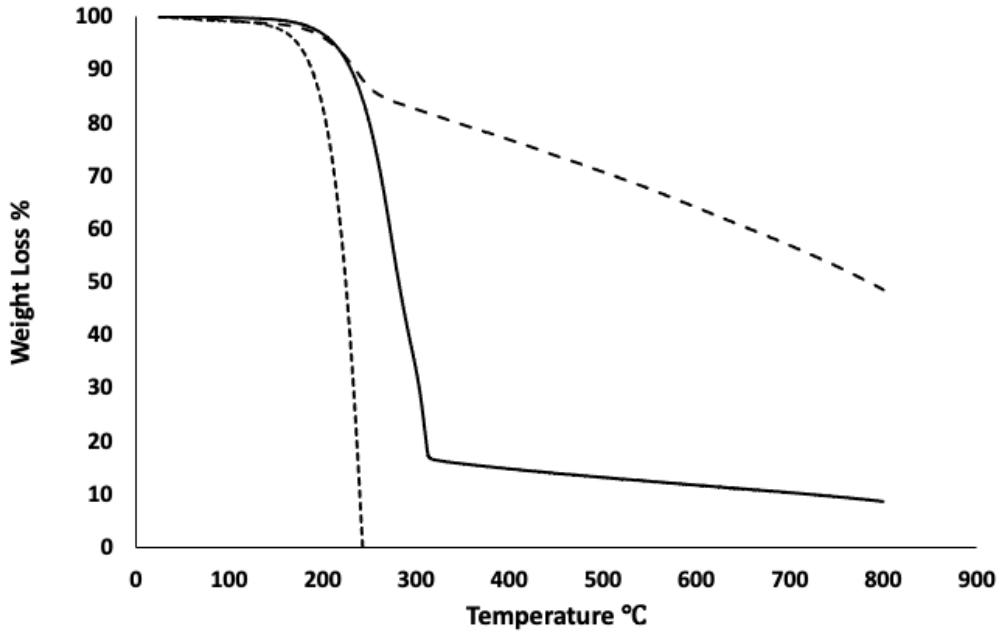

Figure S24. TGA curves of DMBPA (Dotted line), BC90 Polymer (solid line), BC90- CS_2 Insoluble polymer (Dashed line)

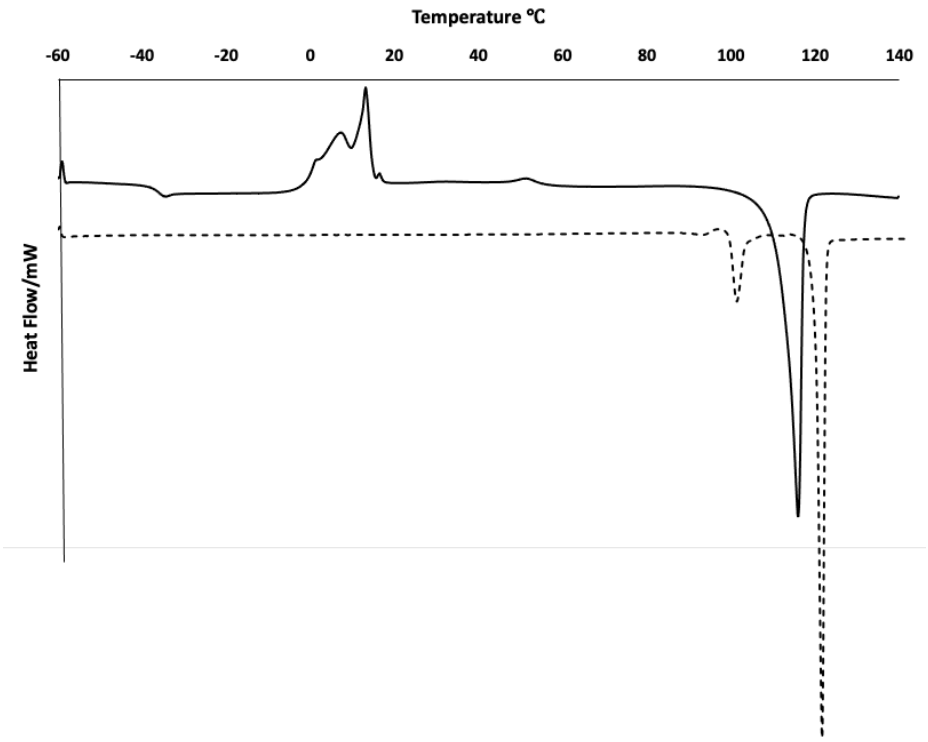

Figure S25. DSC curves of BC90 and sulfur. Polymer BC90(solid line) exhibits exothermic cold crystallization peaks along with the endothermic glass transition and melting peaks. Elemental sulfur DSC curve (dash line) shows two endothermic melting peaks, ß sulfur melting peak at 100 °C followed by the melting of orthorhombic sulfur at 120 °C

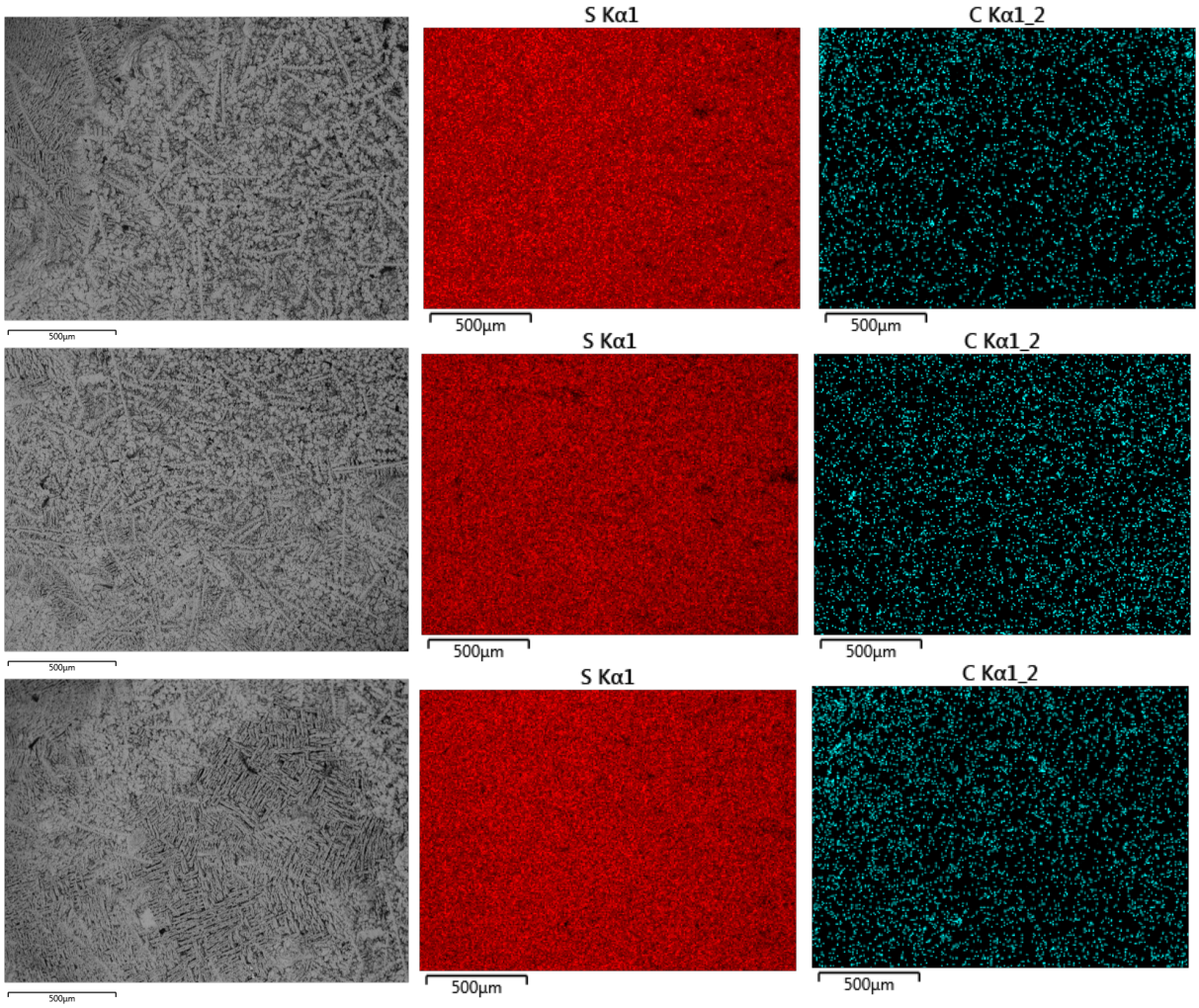

Figure 26. SEM Images of various spots along a **BC90** sample's surface with EDS plots showing good dispersion of organic fragments (blue EDS maps) in the sulfur network (red EDS maps).

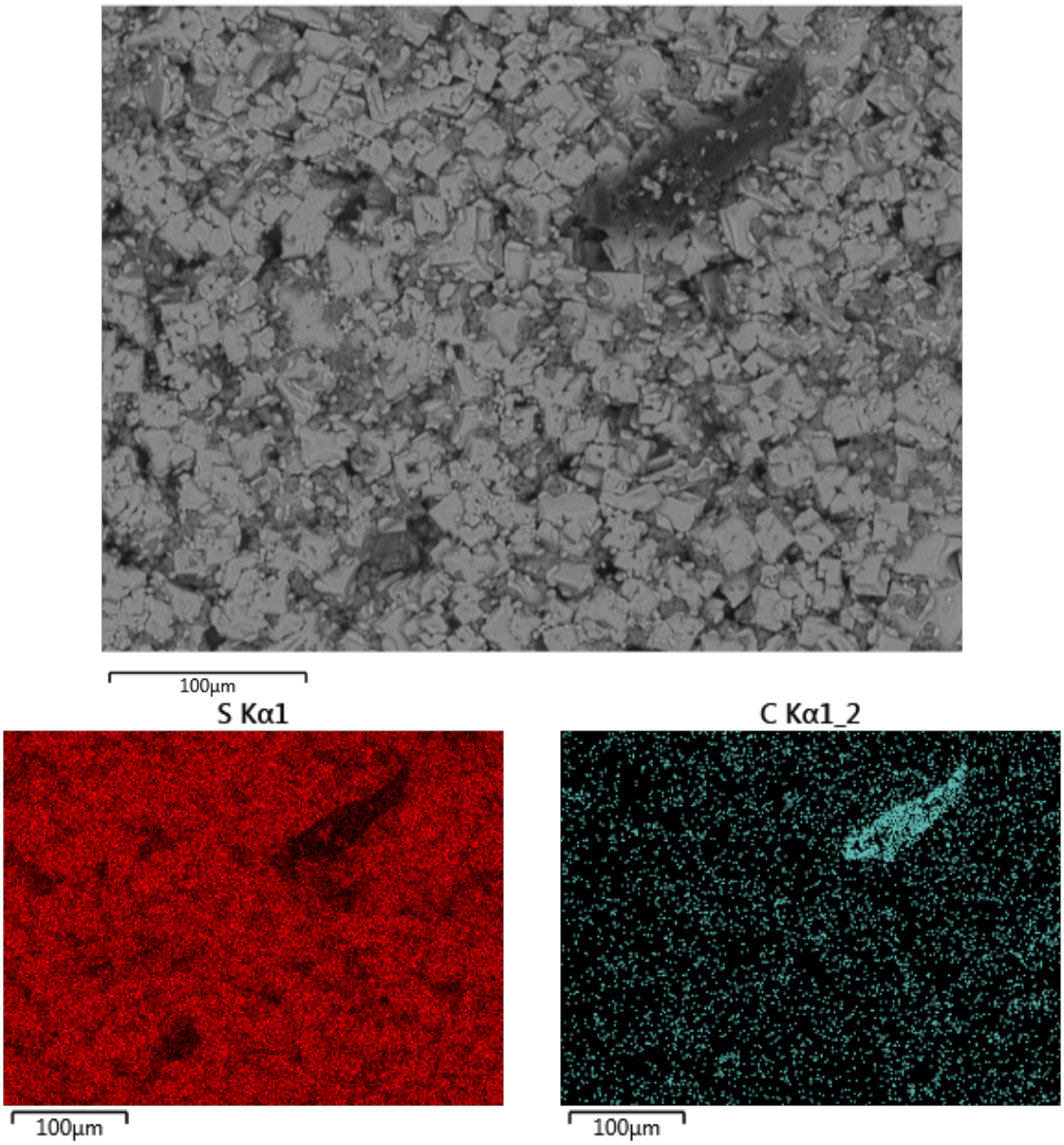

Figure S27. SEM and EDS images showing some agglomeration of organic species within the network. Although the majority of the surface (See Figure S3 for three large areas, for example) much of the surface shows quite uniform dispersion, infrequent agglomeration of carbon-rich domains was observed.