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Supplement of

Ice nucleation by combustion ash particles at conditions relevant to mixed-phase clouds

N. S. Umo et al.

Correspondence to: N. S. Umo (eensu@leeds.ac.uk) and B. J. Murray (b.j.murray@leeds.ac.uk)

The following patterns are provided to support the information in the main article.

1.0 EDX charts for combustion ashes – wood, domestic, and coal bottom ashes.

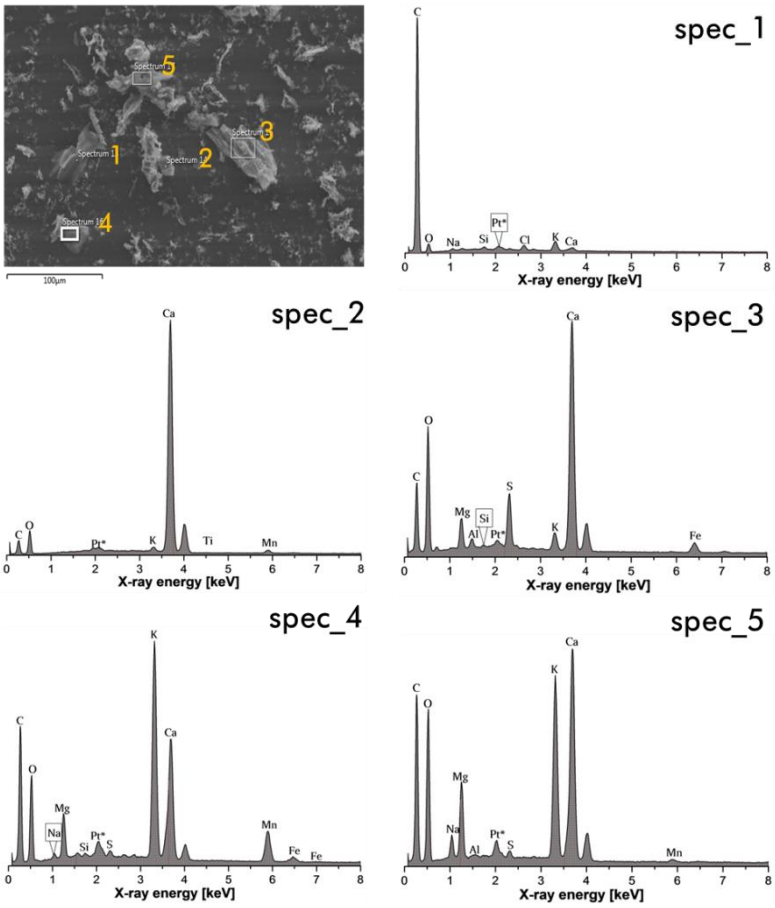

Figure 1

Figure 1: Elemental composition of wood bottom ash measured by energy dispersive X-ray spectroscopy (EDX) that was coupled to a scanning electron microscope (SEM). Platinum/Palladium (Pt/Pd) mixture was used to coat the samples before SEM/EDX spectra were taken; hence, it is asterisked on the spectra. These spectra were background corrected before making this plot. The ordinate (which is not shown) is intensity, in counts per second per energy unit (cps eV^{-1}). The spectra labels (spec_1, spec_2, . . . , spec_n) on the SEM images are the locations from which the EDX scanned.

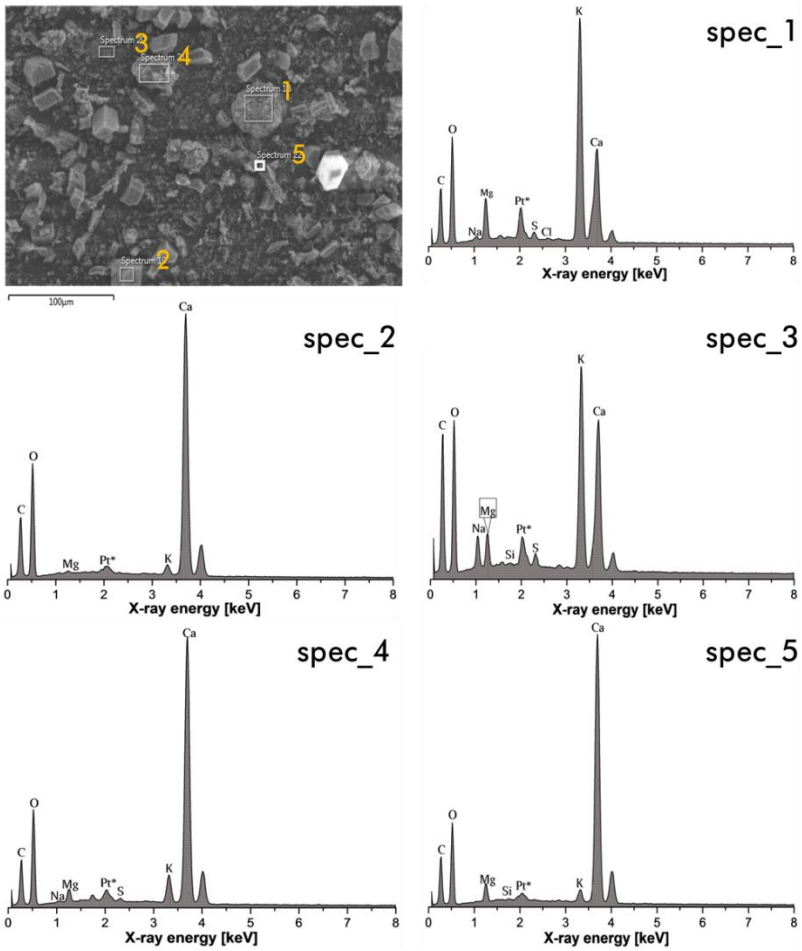

Figure 2: Elemental composition of domestic bottom ash measured by energy dispersive X-ray spectroscopy (EDX) that was coupled to a scanning electron microscope (SEM). Platinum/Palladium (Pt/Pd) mixture was used to coat the samples before SEM/EDX spectra were taken; hence, it is asterisked on the spectra. These spectra were background corrected before making this plot. The ordinate (which is not shown) is intensity, in counts per second per energy unit (cps eV^{-1}). The spectra labels (spec_1, spec_2, . . . , spec_n) on the SEM images are the locations from which the EDX scanned.

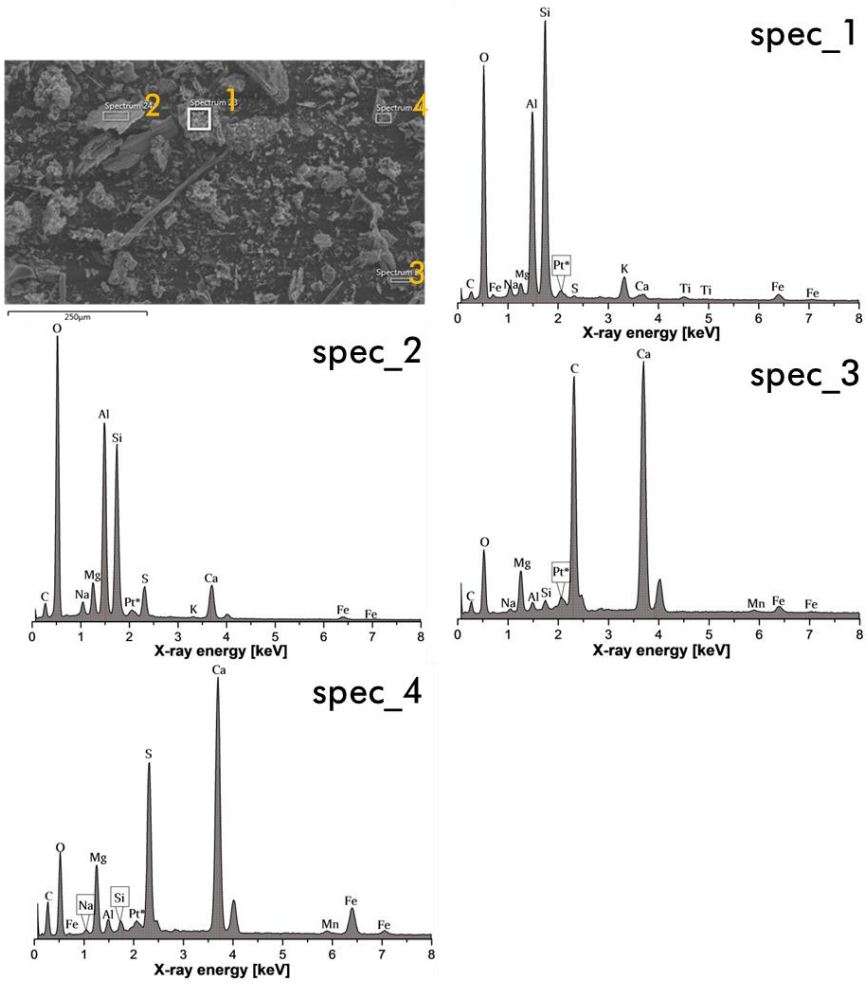

Figure 3: Elemental composition of coal bottom ash measured by energy dispersive X-ray spectroscopy (EDX) that was coupled to a scanning electron microscope (SEM). Platinum/Palladium (Pt/Pd) mixture was used to coat the samples before SEM/EDX spectra were taken; hence, it is asterisked on the spectra. These spectra were background corrected before making this plot. The ordinate (which is not shown) is intensity, in counts per second per energy unit (cps eV^{-1}). The spectra labels (spec_1, spec_2, . . . , spec_n) on the SEM images are the locations from which the EDX scanned.

2.0 X-ray diffraction patterns, fits and residuals for combustion ashes

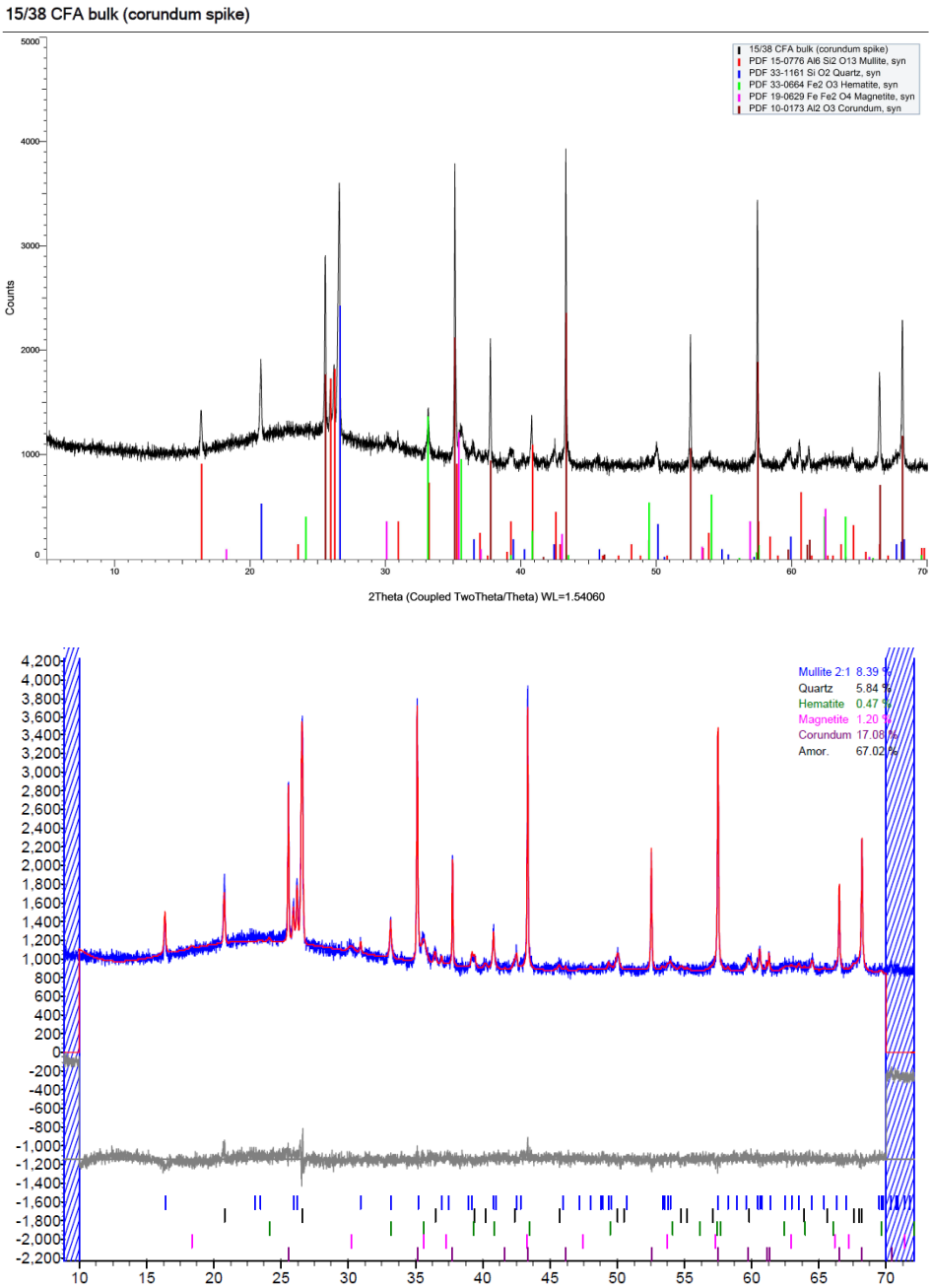

Figure 4: X-ray diffraction pattern of coal fly ash (bulk) for the qualitative and quantitative analyses of its mineral composition.

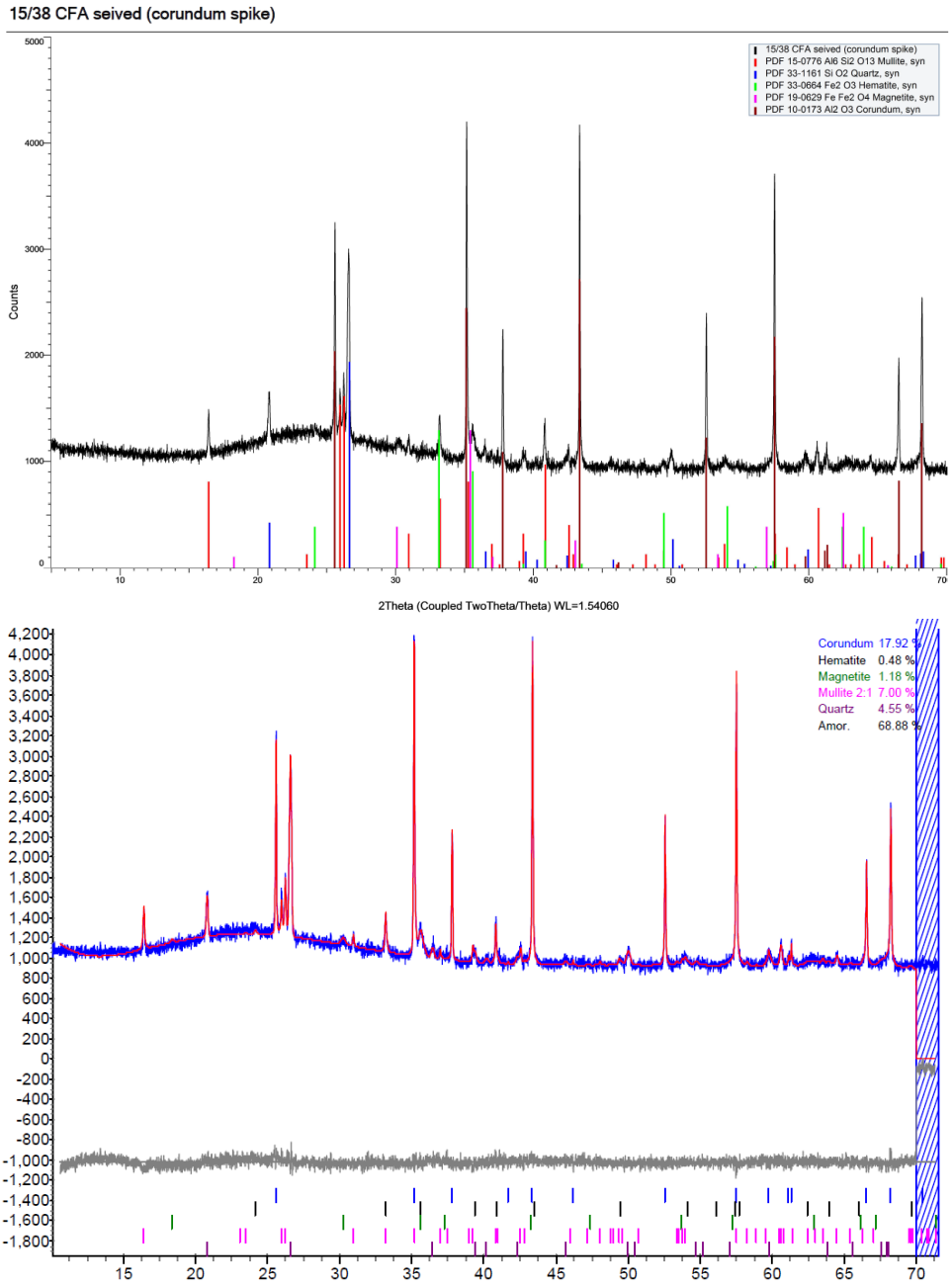

Figure 5: X-ray diffraction pattern of coal fly ash (sieved to ≤ 40 µm) for the qualitative and quantitative analyses of its mineral composition.

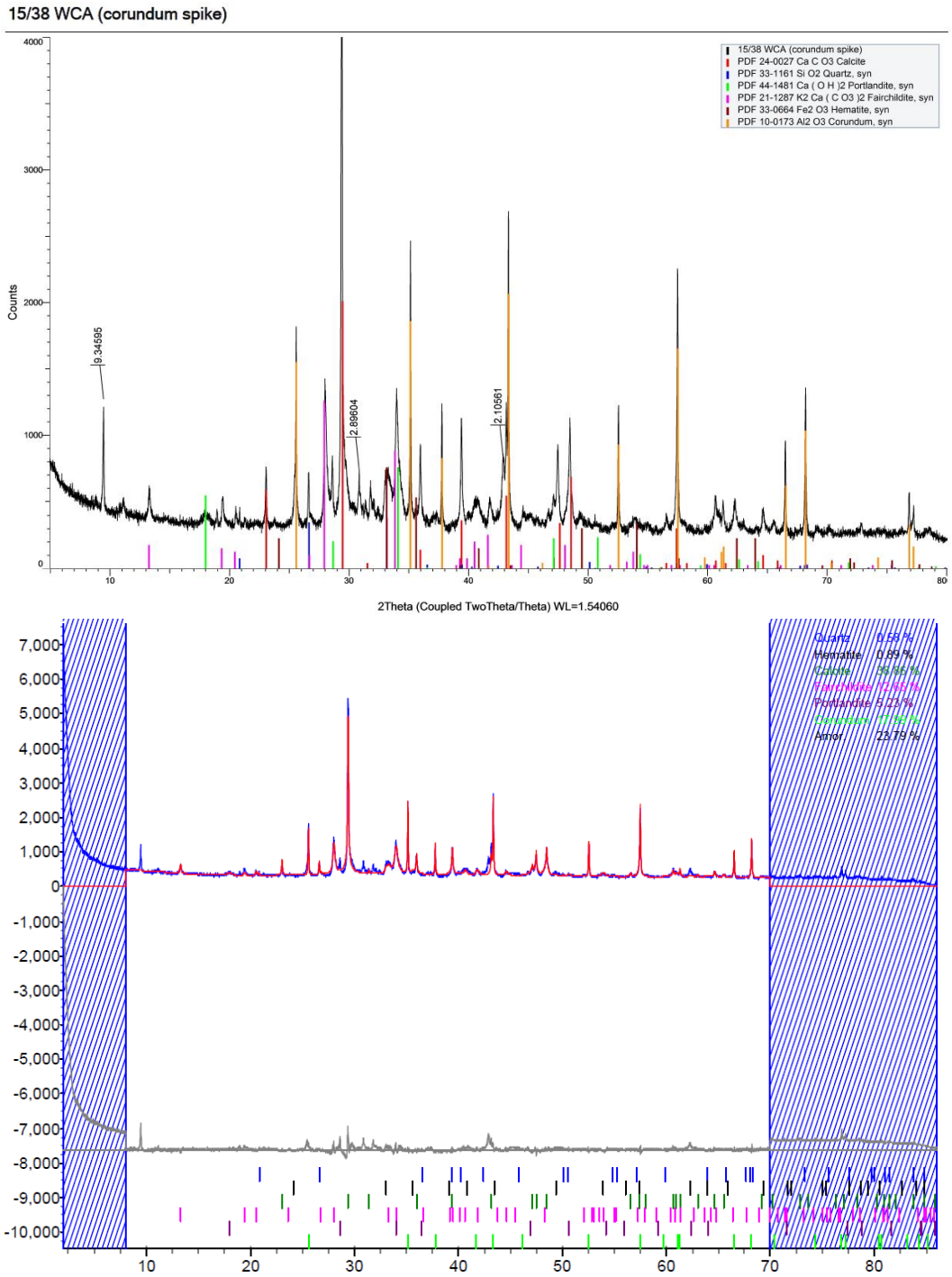

Figure 6: X-ray diffraction pattern of wood bottom ash (sieved to ≤ 40 µm) for the qualitative and quantitative analyses of its mineral composition.

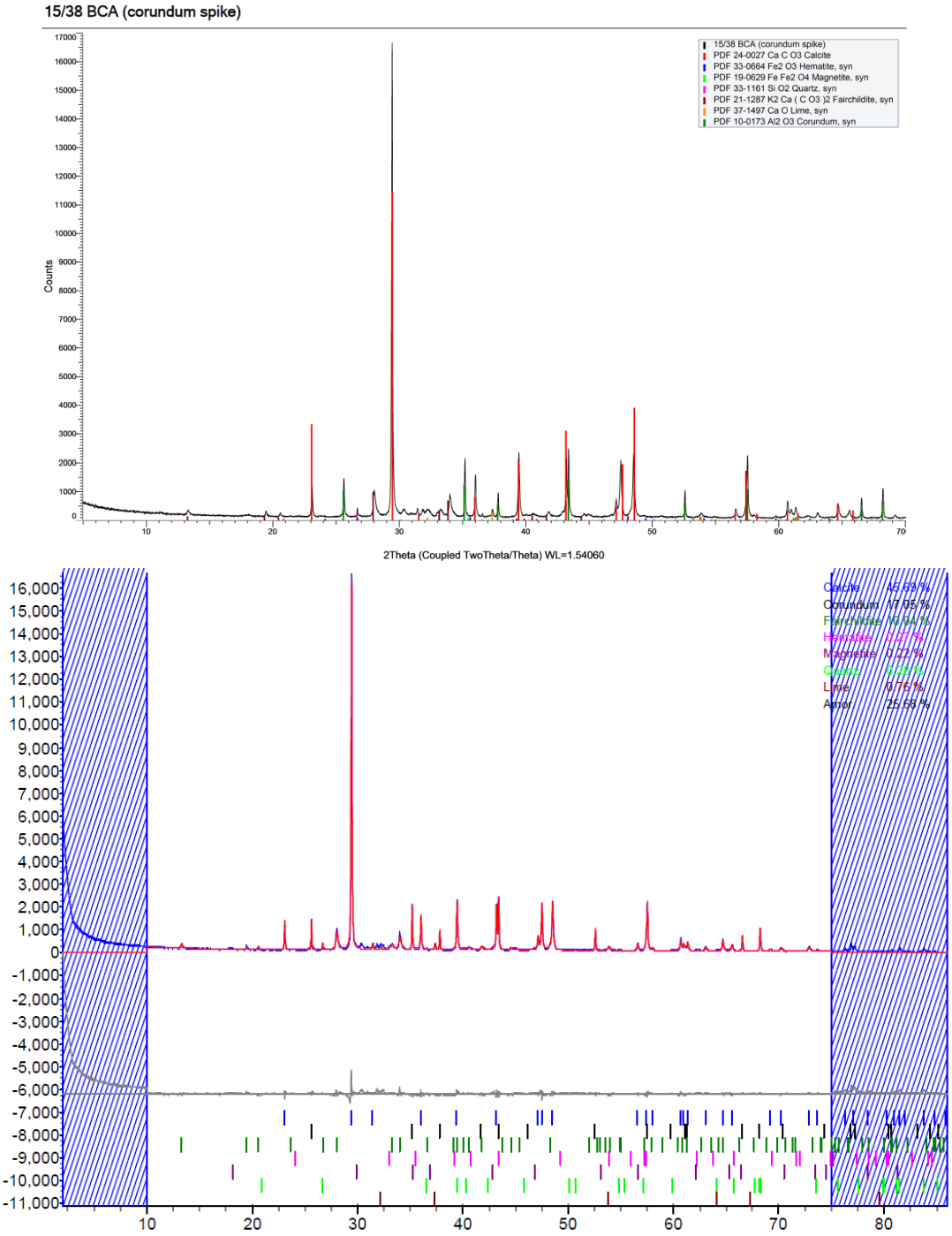

Figure 7: X-ray diffraction pattern of domestic bottom ash (sieved to ≤ 40 μm) for the qualitative and quantitative analyses of its mineral composition.

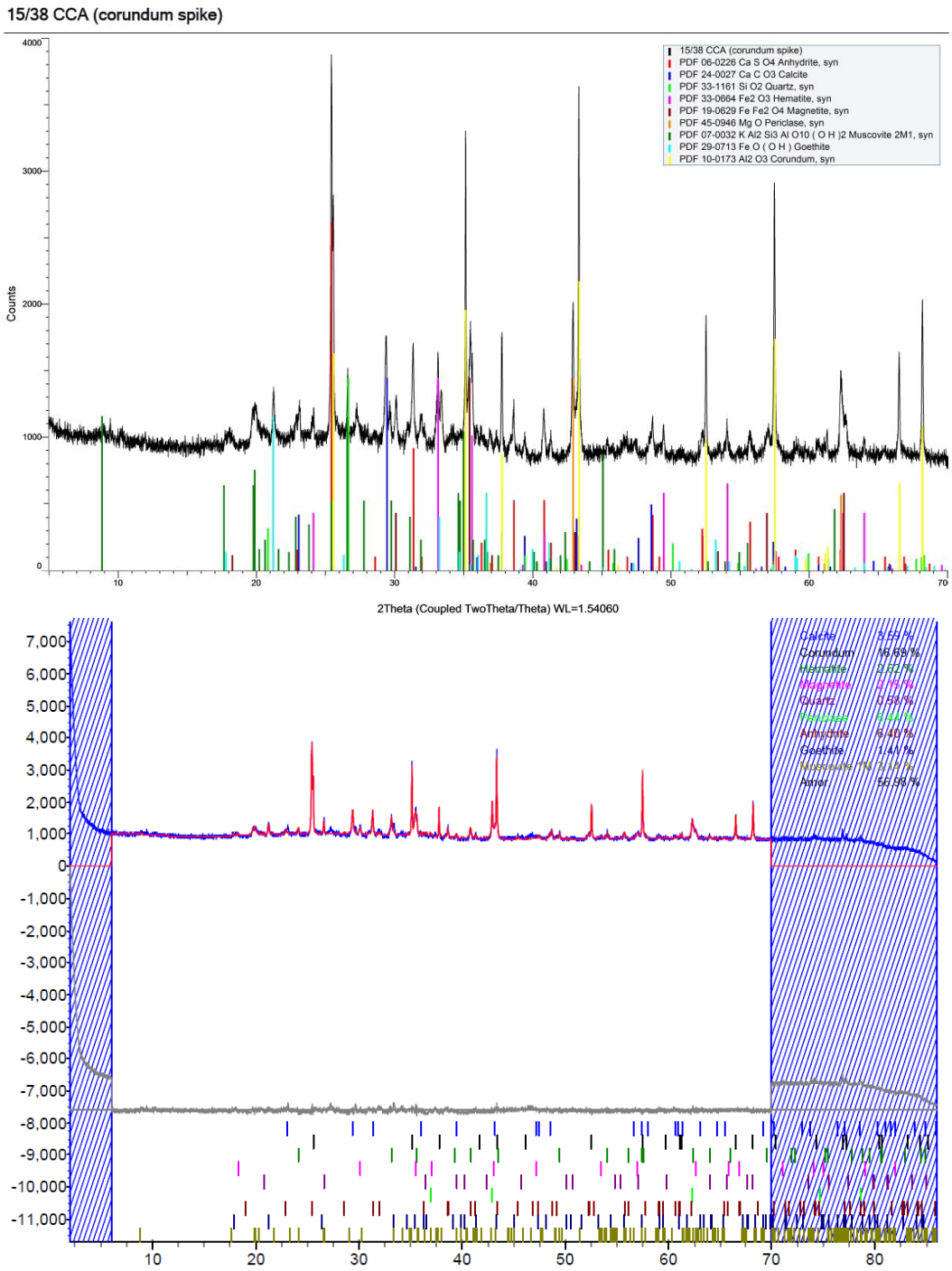

Figure 8: X-ray diffraction pattern of coal bottom ash (sieved to ≤ 40 μm) for the qualitative and quantitative analyses of its mineral composition.