

Supplement of Atmos. Meas. Tech., 11, 3447–3456, 2018  
<https://doi.org/10.5194/amt-11-3447-2018-supplement>  
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*Supplement of*

## **Organosulfates in atmospheric aerosol: synthesis and quantitative analysis of PM<sub>2.5</sub> from Xi'an, northwestern China**

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The  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR spectra of synthesized organosulfate standards are shown in Figure S1-S8 below. These  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR spectra were recorded on a Bruker Advance-III 400 MHz spectrometer at 400 and 100 MHz, respectively using trimethylsilane (TMS) as an internal standard.

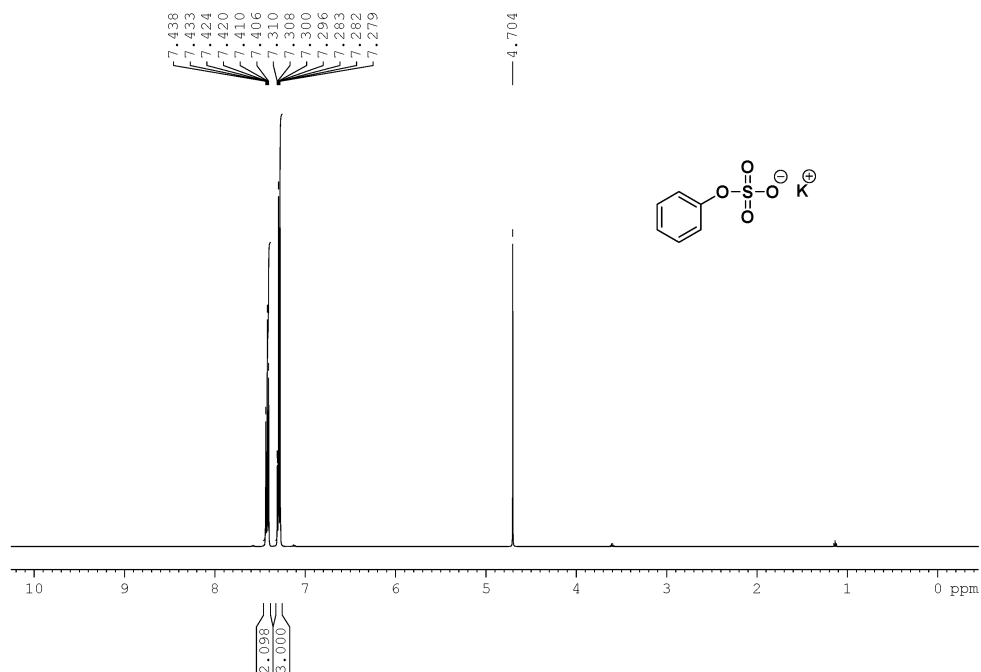


Figure S1.  $^1\text{H}$  NMR spectrum of potassium phenyl sulfate in  $\text{D}_2\text{O}$ .

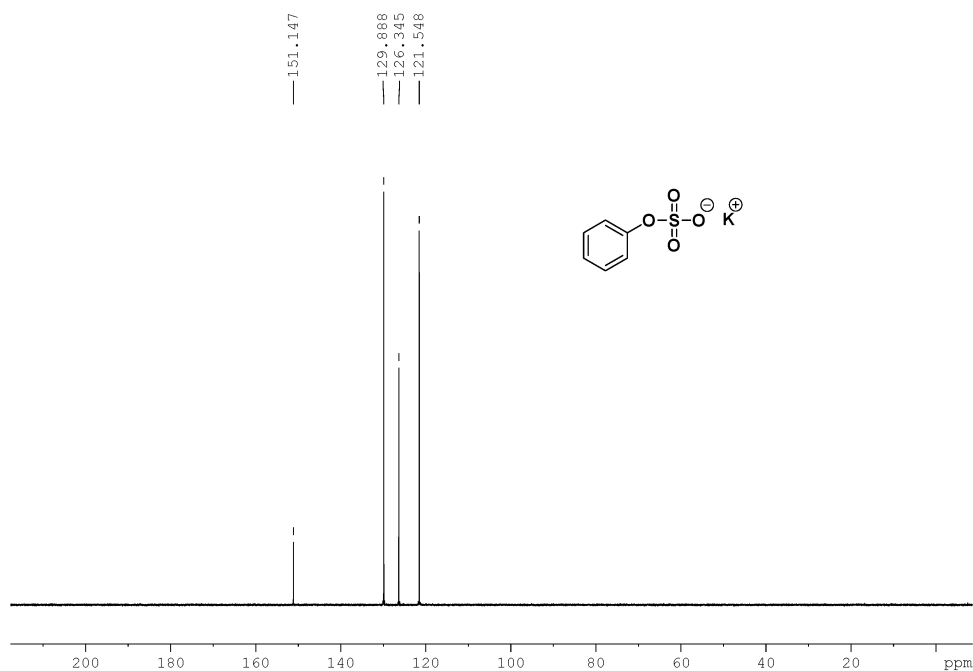


Figure S2.  $^{13}\text{C}$  NMR spectrum of potassium phenyl sulfate in  $\text{D}_2\text{O}$ .

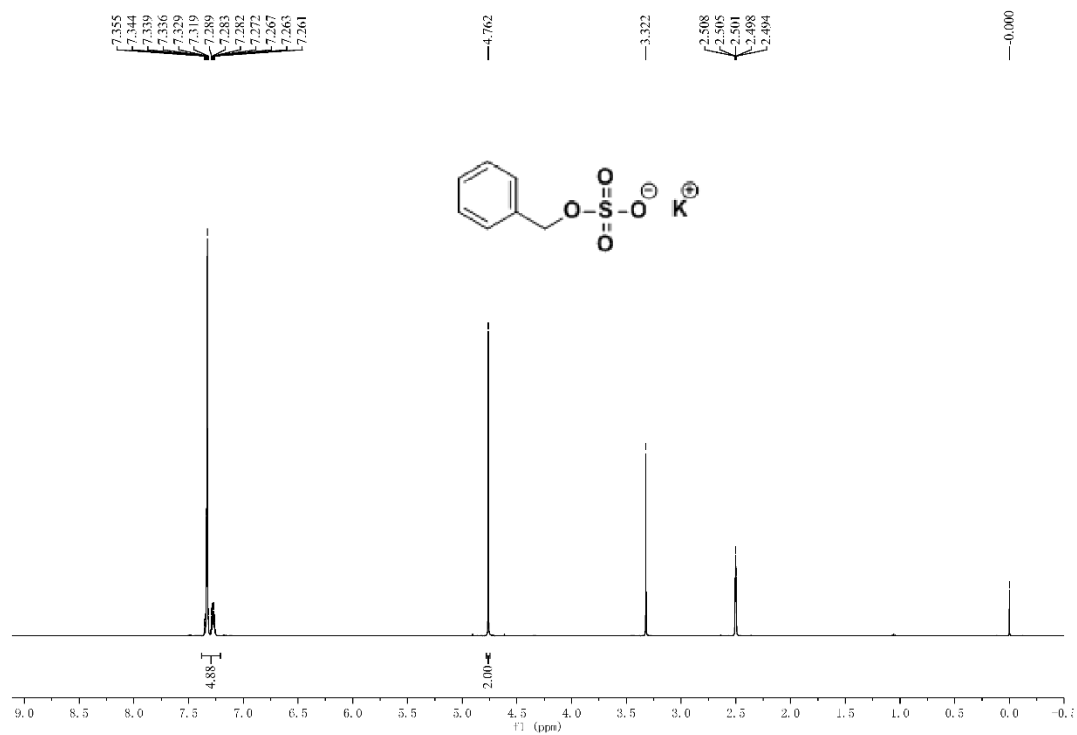


Figure S3. <sup>1</sup>H NMR spectrum of potassium benzyl sulfate in DMSO-*d*<sub>6</sub>.

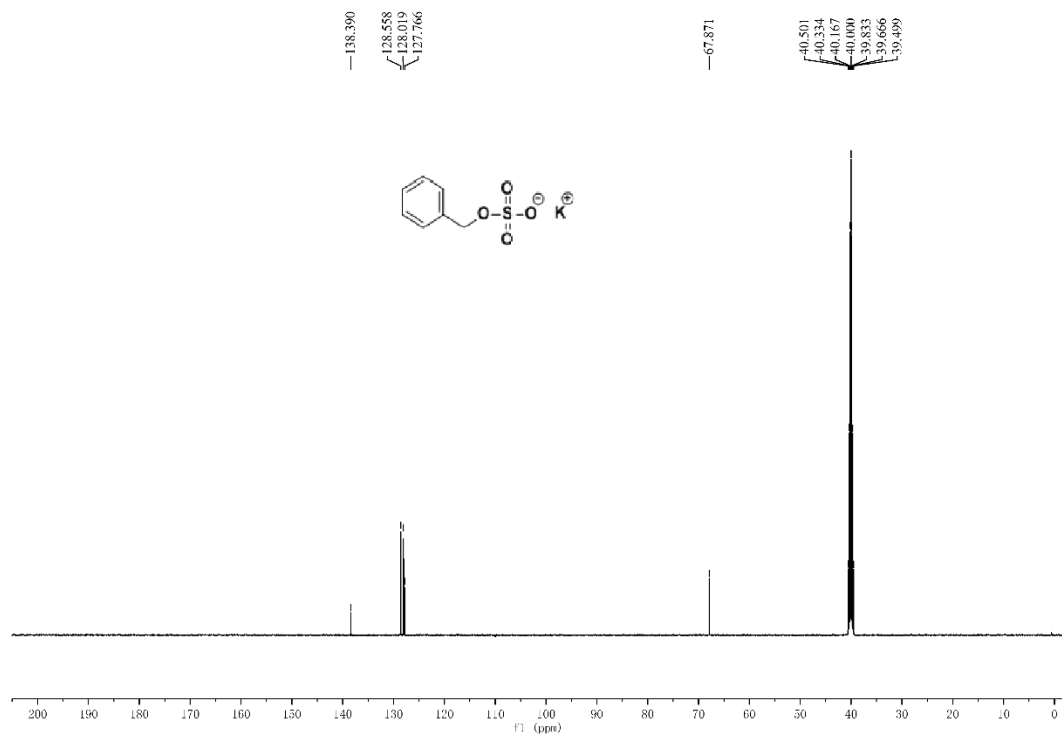


Figure S4. <sup>13</sup>C NMR spectrum of potassium benzyl sulfate in DMSO-*d*<sub>6</sub>.

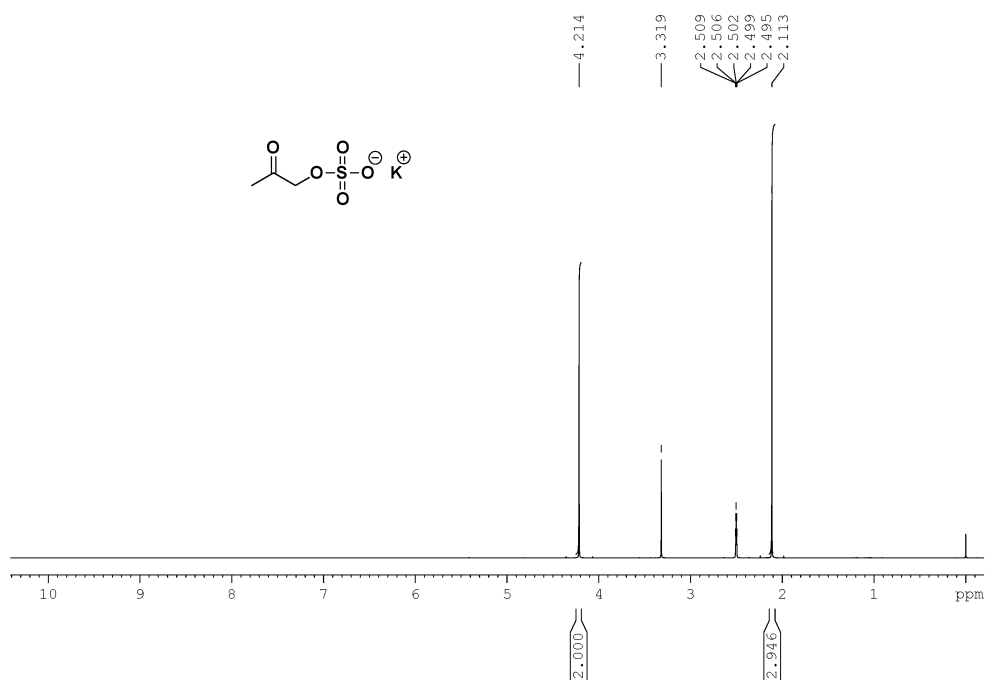


Figure S5.  $^1\text{H}$  NMR spectrum of potassium hydroxyacetone sulfate in  $\text{DMSO-}d_6$ .

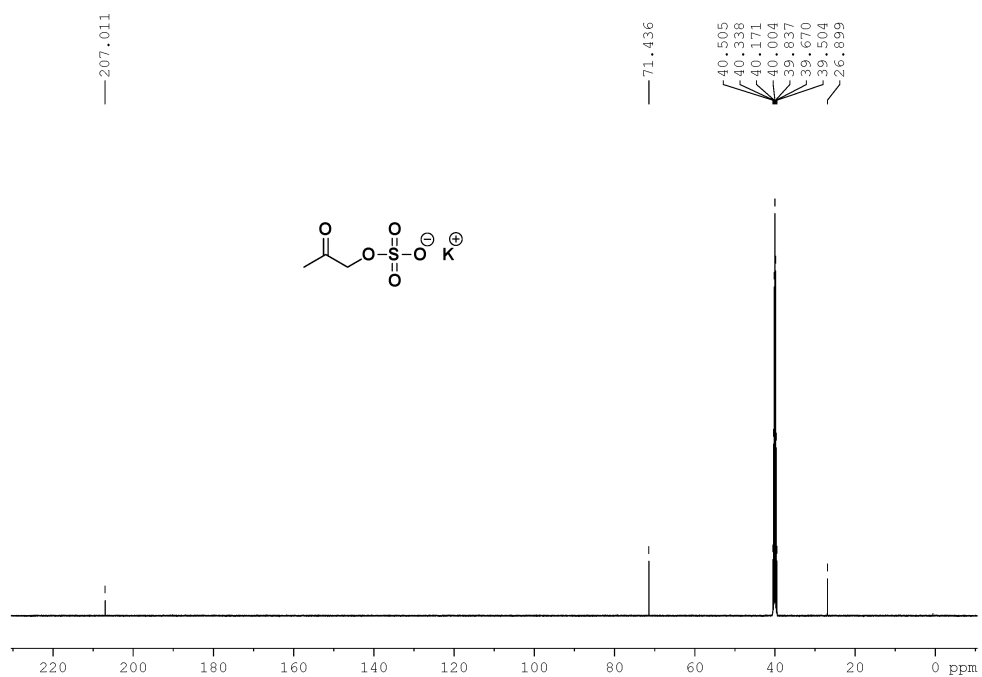


Figure S6.  $^{13}\text{C}$  NMR spectrum of potassium hydroxyacetone sulfate in  $\text{DMSO-}d_6$ .

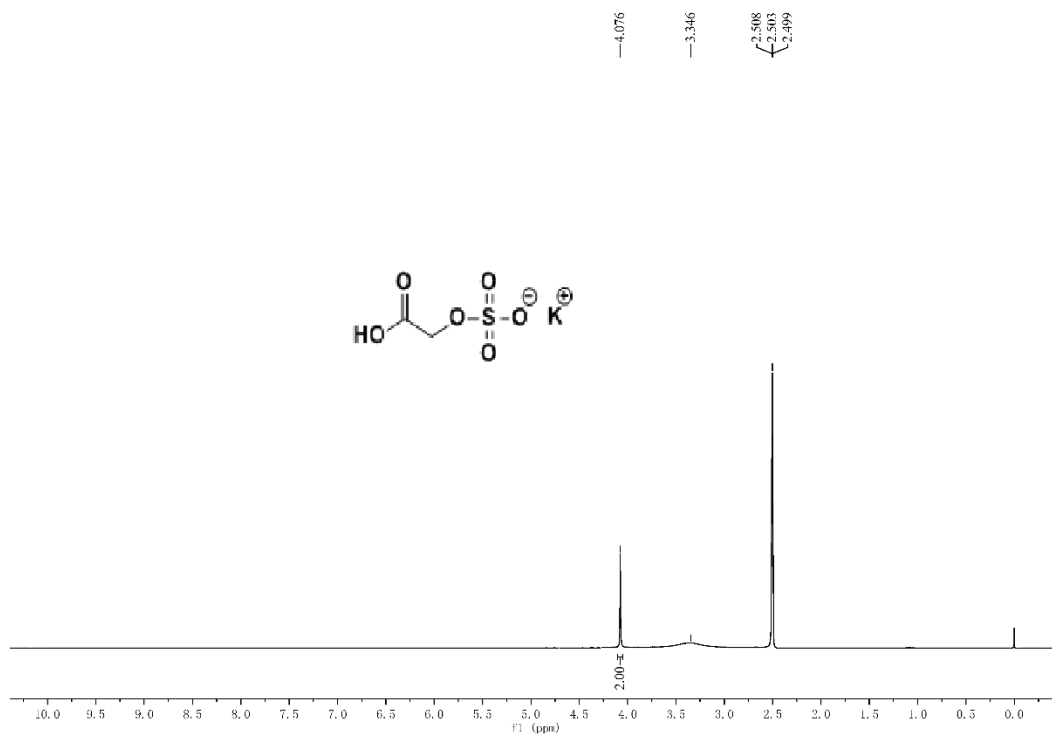


Figure S7.  $^1\text{H}$  NMR spectrum of potassium glycolic acid sulfate in  $\text{DMSO-}d_6$ .

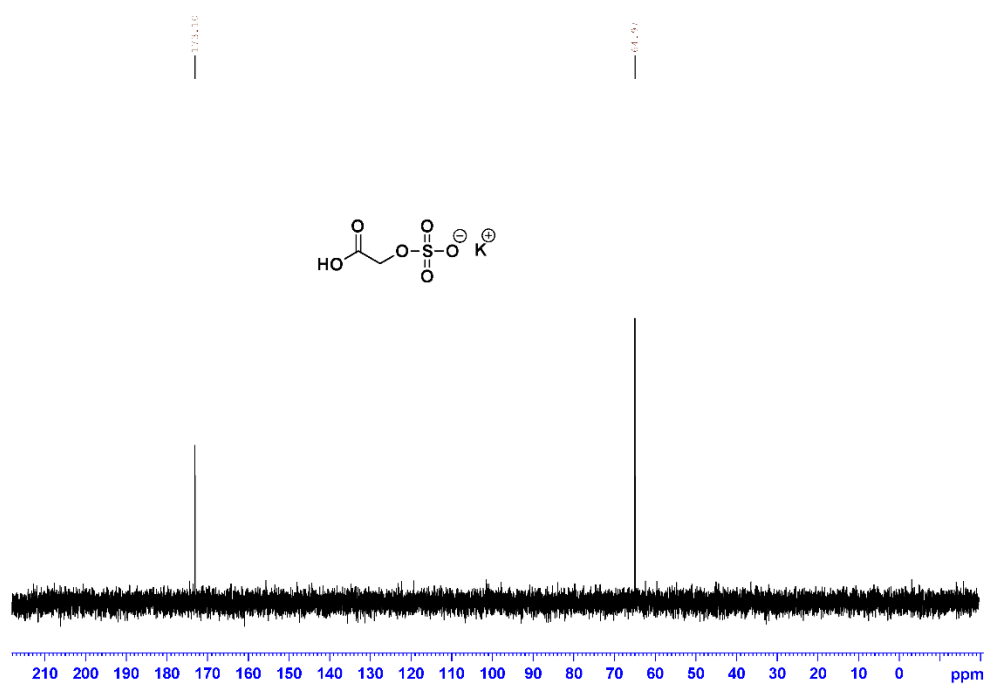


Figure S8.  $^{13}\text{C}$  NMR spectrum of potassium glycolic acid sulfate in  $\text{D}_2\text{O}$ .