

Electronic Supplementary Material

An unprecedented tridentate-bridging coordination mode of permanganate-ion: The synthesis of an anionic coordination polymer - $[\text{Co}^{\text{III}}(\text{NH}_3)_6]_n[(\text{K}(\kappa^1\text{-Cl})_2(\mu^{2,2',2''}\text{-}(\kappa^3\text{-O},\text{O}',\text{O}''\text{-MnO}_4)_2)_{n^\infty})]$ -containing potassium central ion and chlorido and permanganato ligands

László Kótai^{1*}, Kende Attila Béres^{1,2}, Attila Farkas³, Berta Barta Holló⁴, Vladimir M. Petrusovski⁵, Zoltán Homonnay^{1,6}, László Trif¹, and Laura Bereczki¹

¹Institute of Materials and Environmental Chemistry, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary; beres.kende.attila@ttk.hu (K.A.B.); nagyne.bereczki.laura@ttk.mta.hu (L.B.)

²György Hevesy PhD School of Chemistry, ELTE Eötvös Loránd University, Budapest, Hungary

³Department of Organic Chemistry and Technology, Faculty of Chemical Technology and Biotechnology, Budapest University of Technology and Economics, Budapest, Hungary; farkas.attila@vbk.bme.hu

⁴Department of Chemistry, Biochemistry and Environmental Protection, Faculty of Sciences, University of Novi Sad, Novi Sad, Serbia

⁵Faculty of Natural Sciences and Mathematics, Ss. Cyril and Methodius University, MK-1000 Skopje, North Macedonia; vladop@pmf.ukim.mk

⁶Institute of Chemistry, ELTE Eötvös Loránd University, Budapest, Hungary; homonnay.zoltan@ttk.elte.hu

*Correspondence: kotai.laszlo@ttk.hu

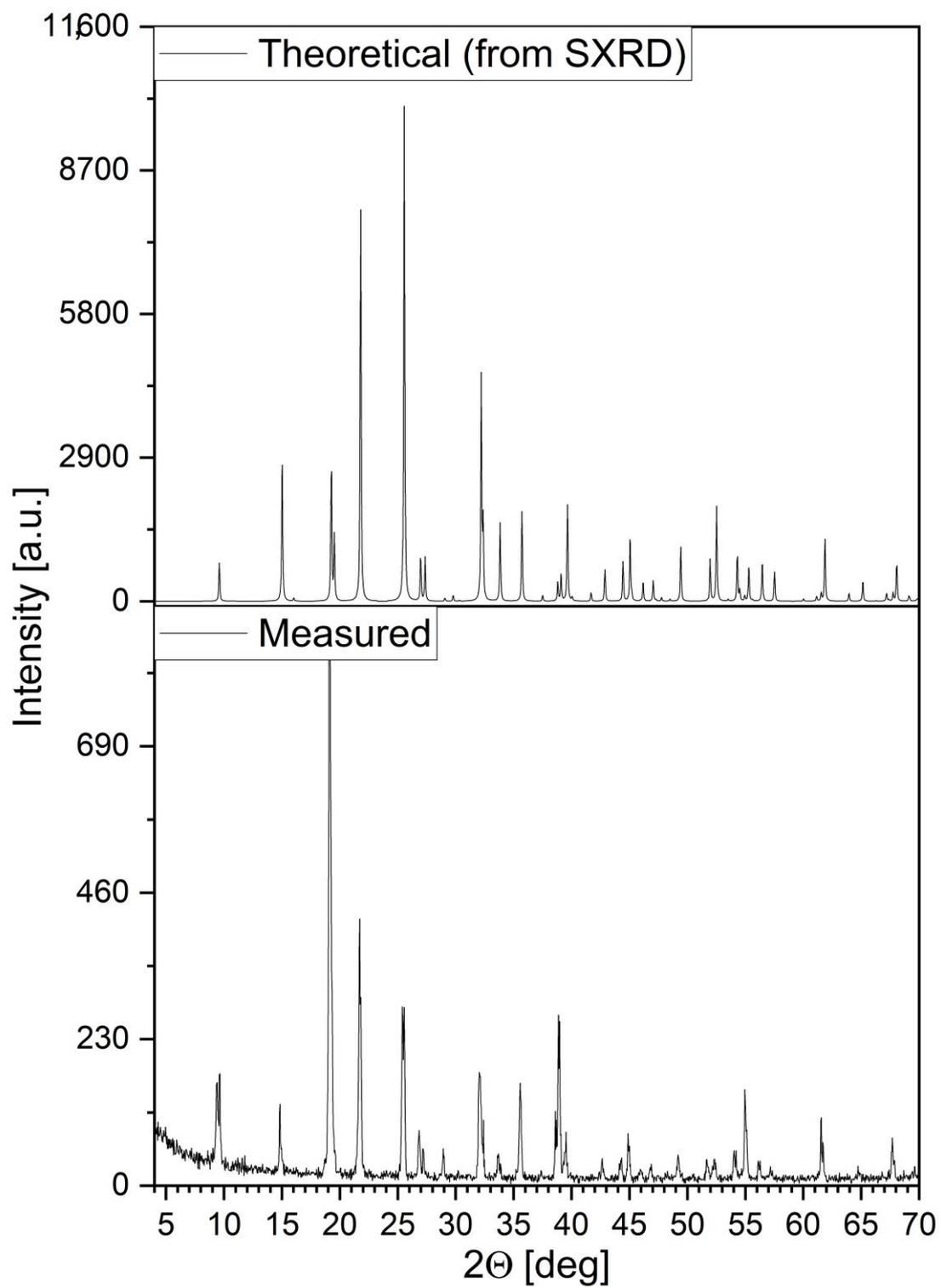


Figure S1. The theoretical (100 K) and experimental (298 K) powder X-ray diffractogram of compound **1** at room temperature.

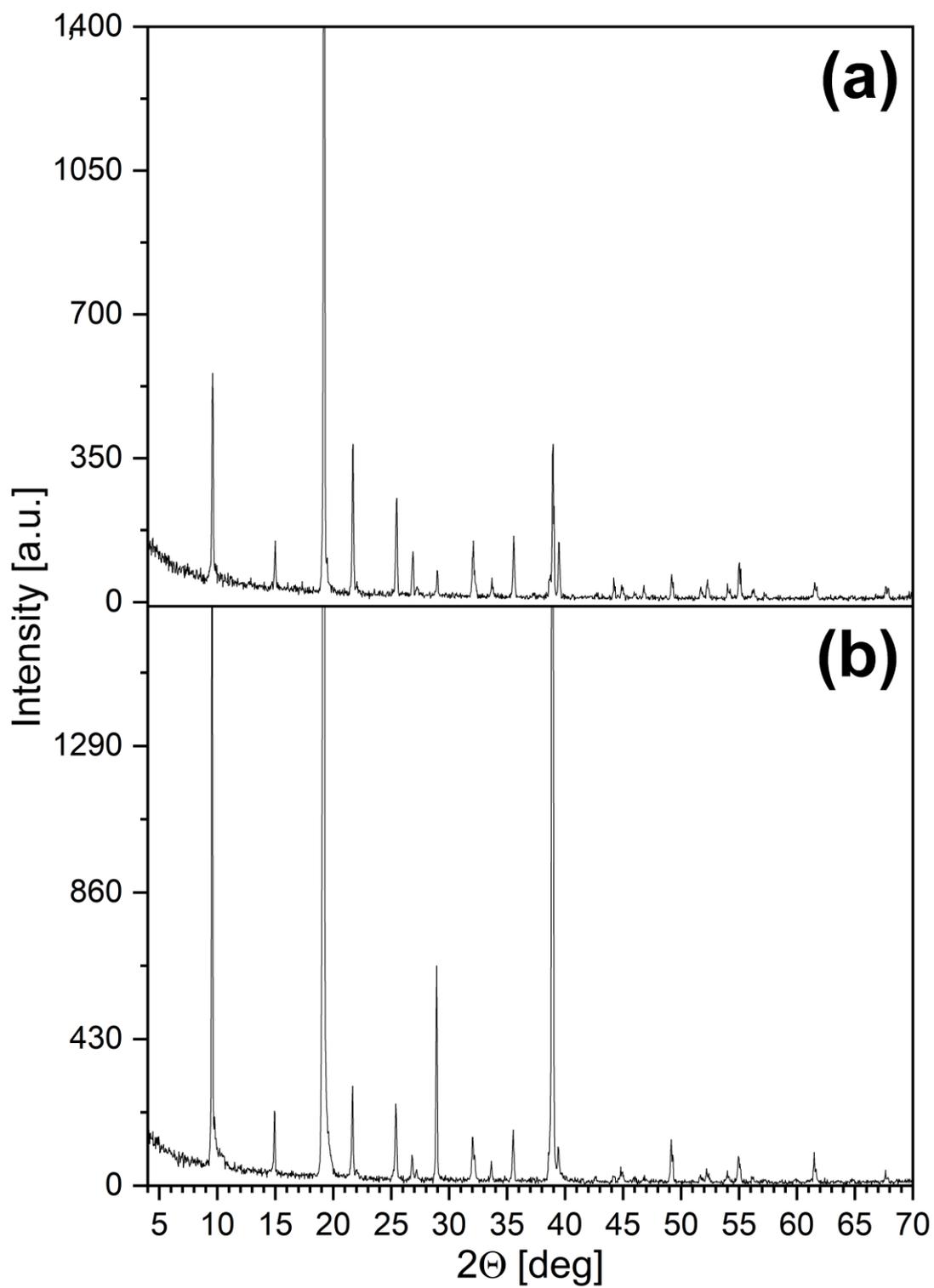


Figure S2. The experimental powder X-ray diffractogram of compound **1** was prepared at (a) room temperature and (b) at 5°C .

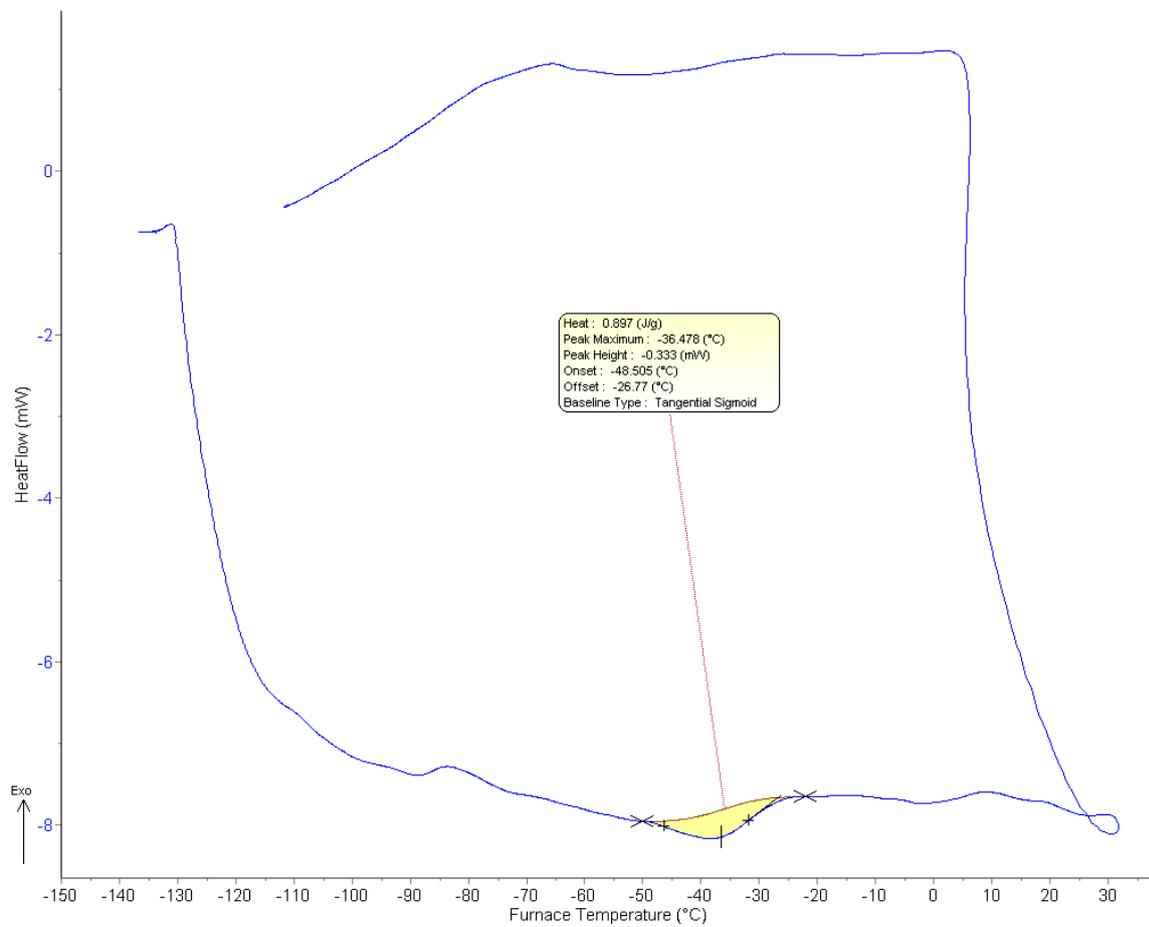


Figure S3. The cryo-DSC curve of compound 1.

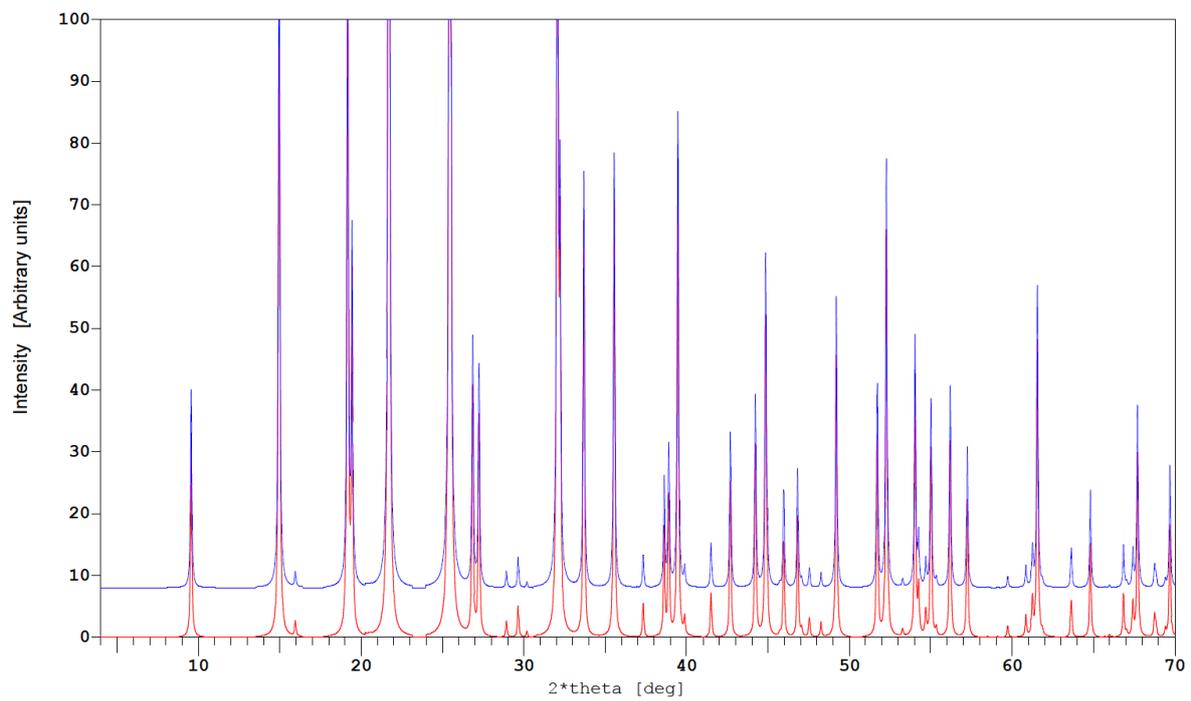


Figure S4. The comparison of the theoretical PXRDs of compound **1** (blue-100 K, red-273K).

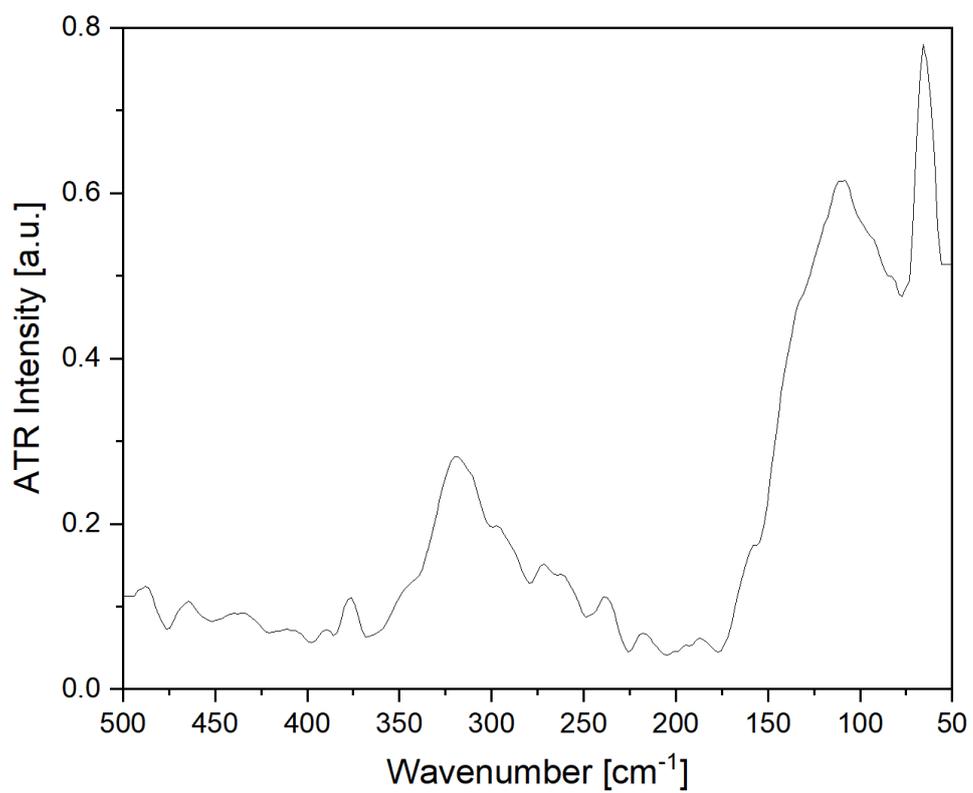


Figure S5. Far-IR spectrum of compound **1**.

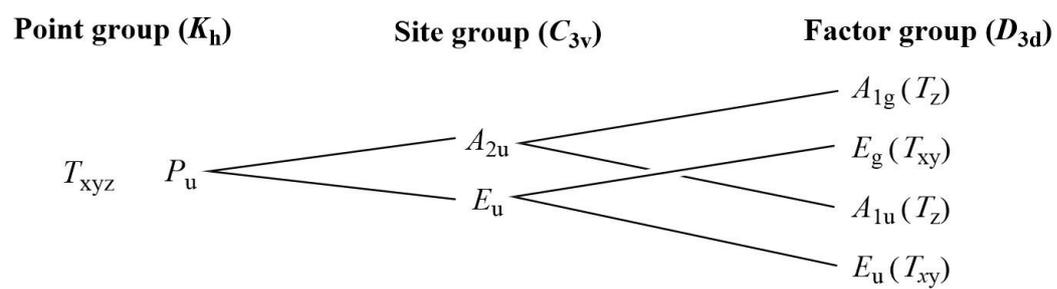


Figure S6. The correlation analysis of the chloride-ion translation modes in compound **1**.

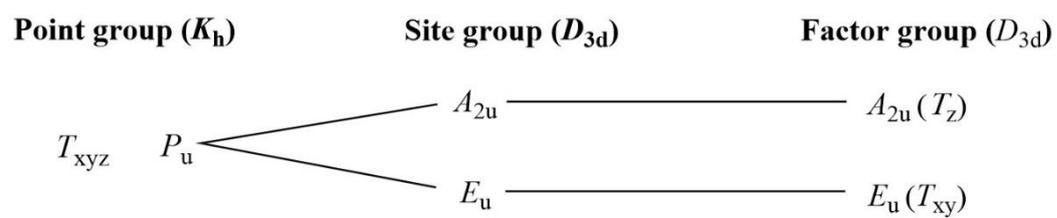


Figure S7. The correlation analyses of the central K^+ and Co^{III} ions in compound **1**.

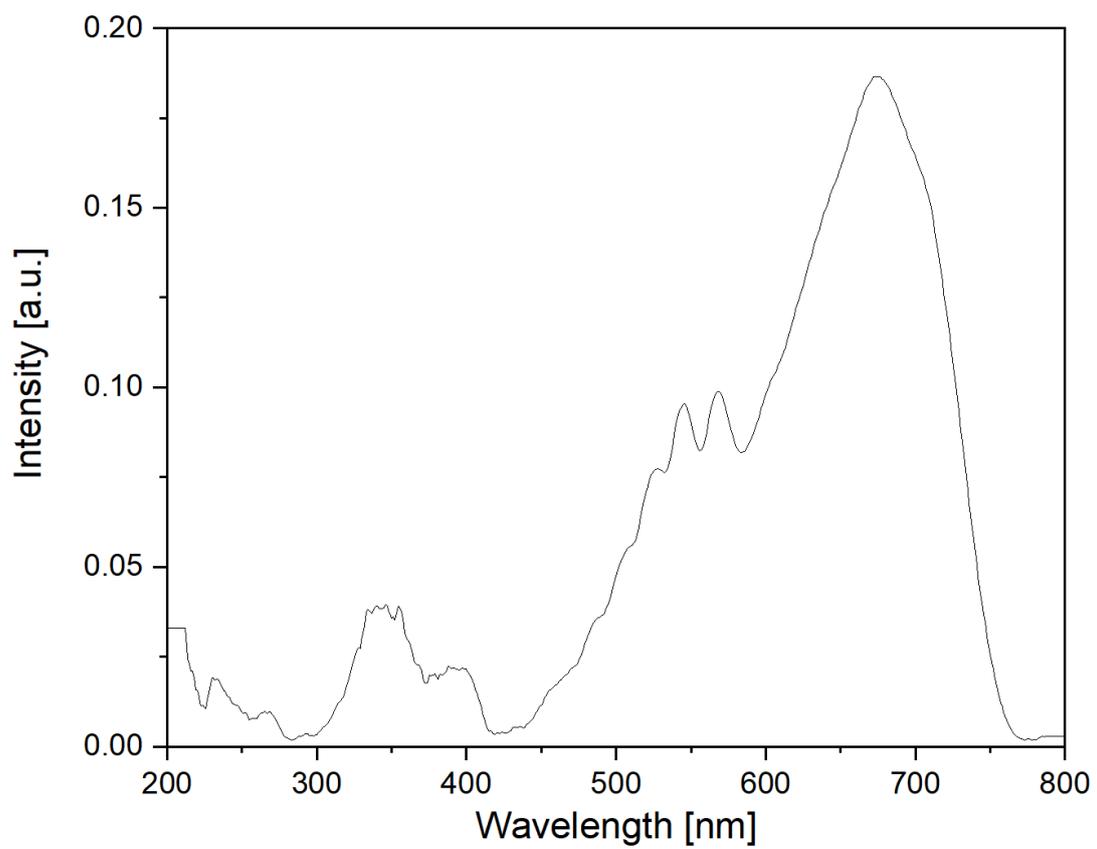


Figure S8. The UV-VIS spectrum of compound **1**.

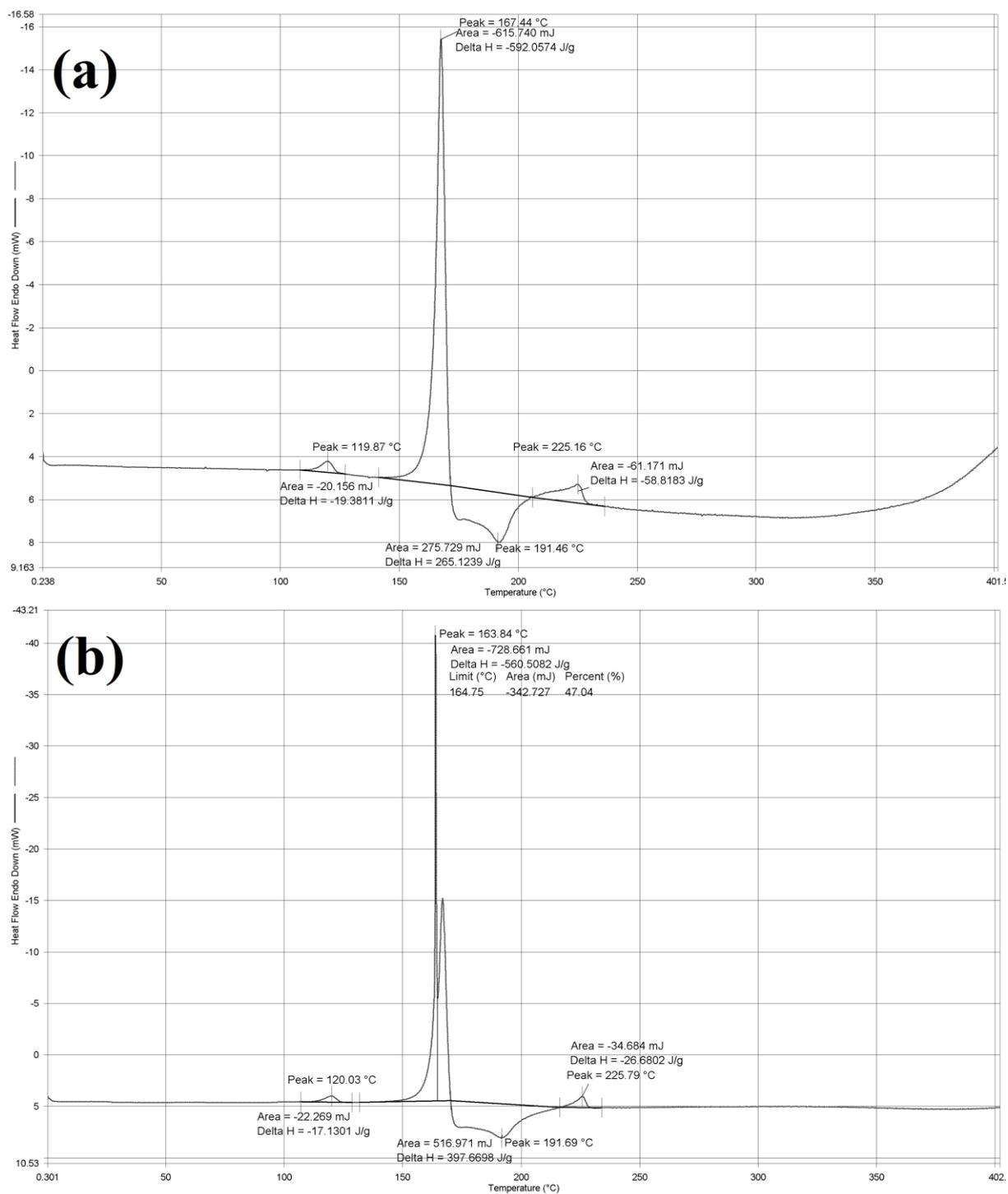


Figure S9. The DSC curves of compound **1** in (a) an oxidative and (b) an inert atmosphere.

Table S1. DSC results of compound **1** in an Ar and O₂ atmosphere at a 5 °C/min heating rate.

Peak temperature, °C	Reaction heat, kJ/mol	Peak temperature, °C	Reaction heat, kJ/mol
N ₂		O ₂	
120.0	-8.719	119.9	-9.865
163.8	-285.293	167.4	-301.351
164.8	-174.445		
191.7	263.163	191.5	134.945
225.9	-13.580	225.6	-29.938

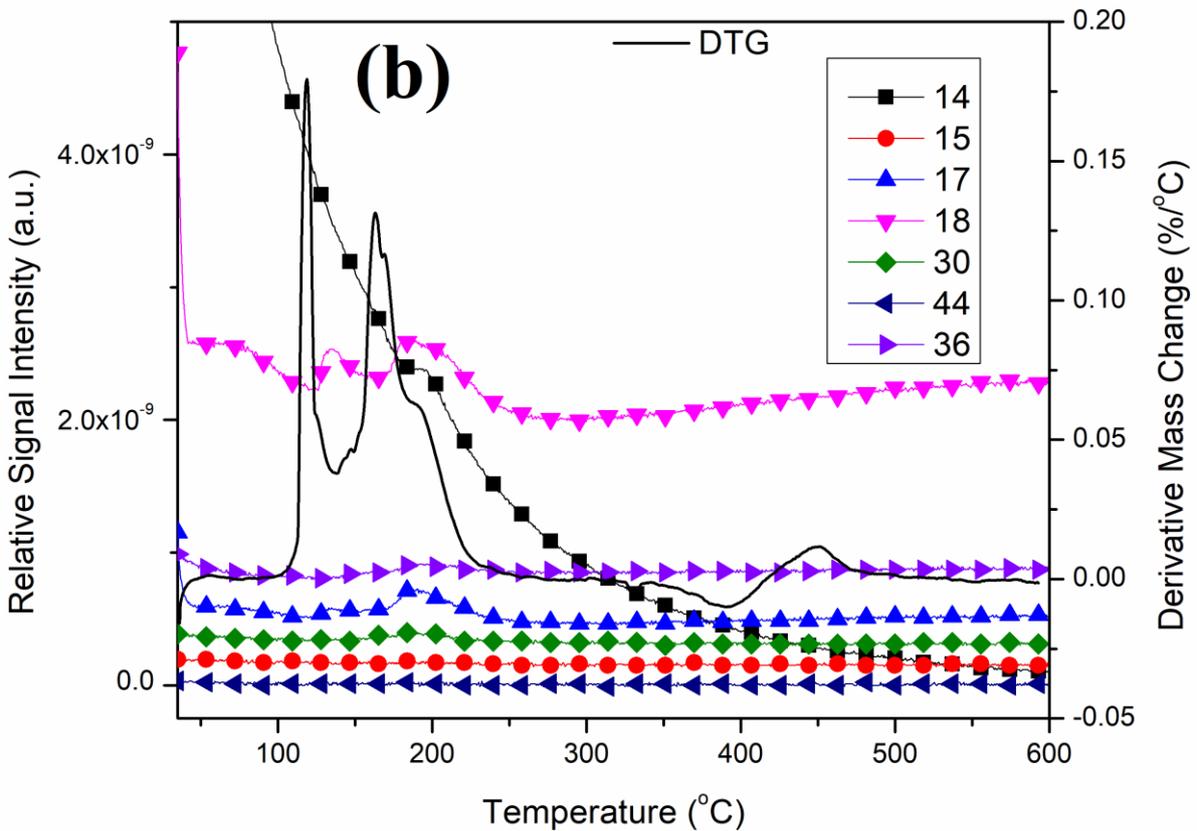
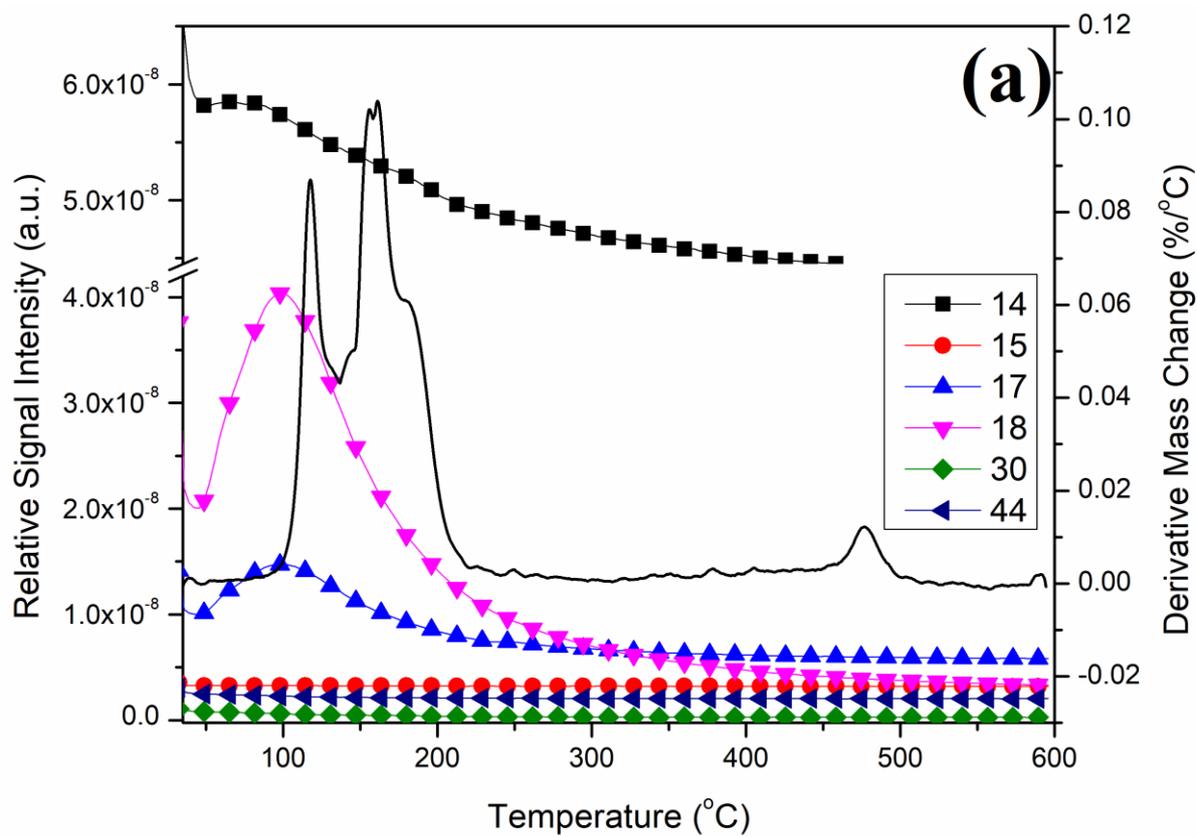


Figure S10. The TG-MS measurements of compound **1** (a) in an oxidative and (b) in an inert atmosphere.

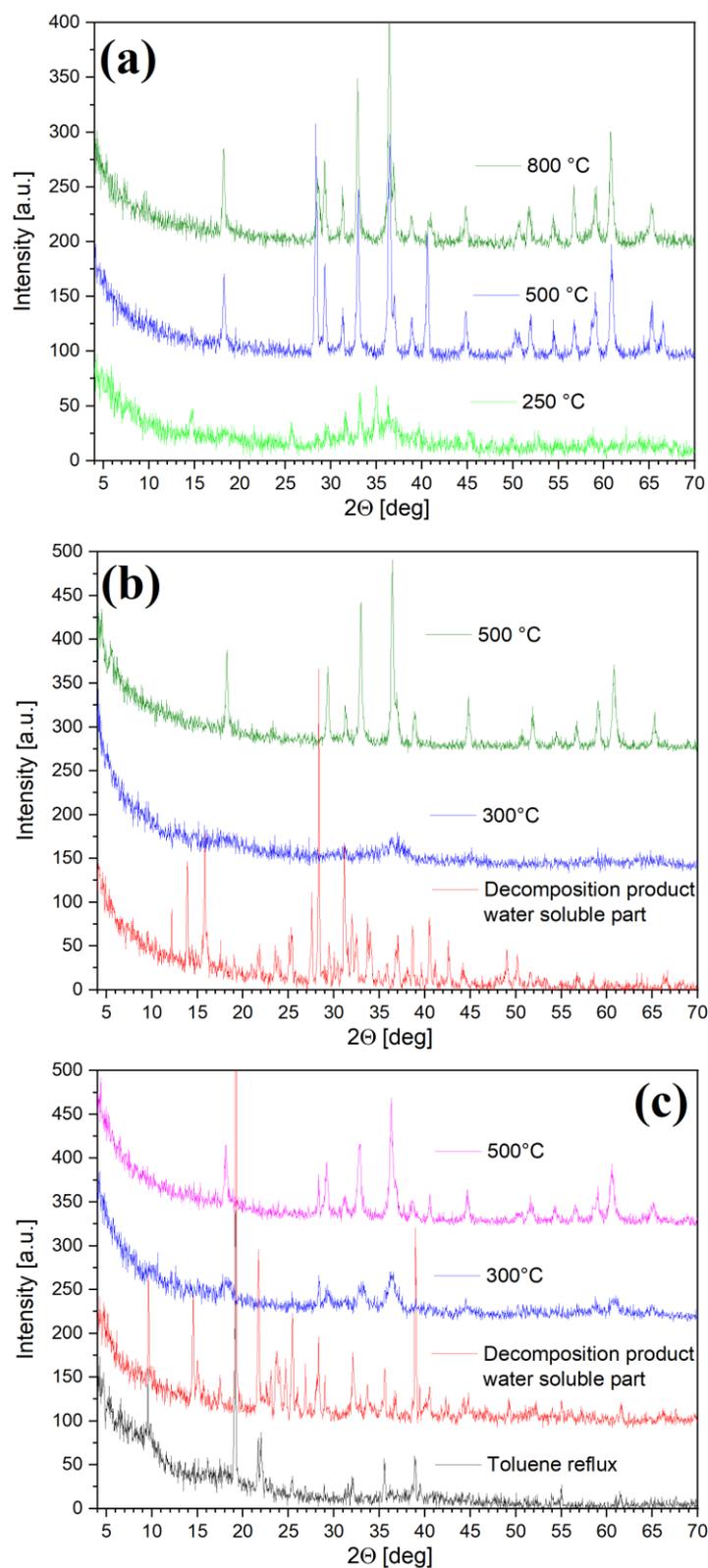


Figure S11. The PXRD of the decomposition products prepared from compound **1** (a) in an air atmosphere, (b) in an air atmosphere without the water-soluble part, and (c) in toluene at reflux temperature with subsequent heat treatment in a furnace in an air atmosphere.

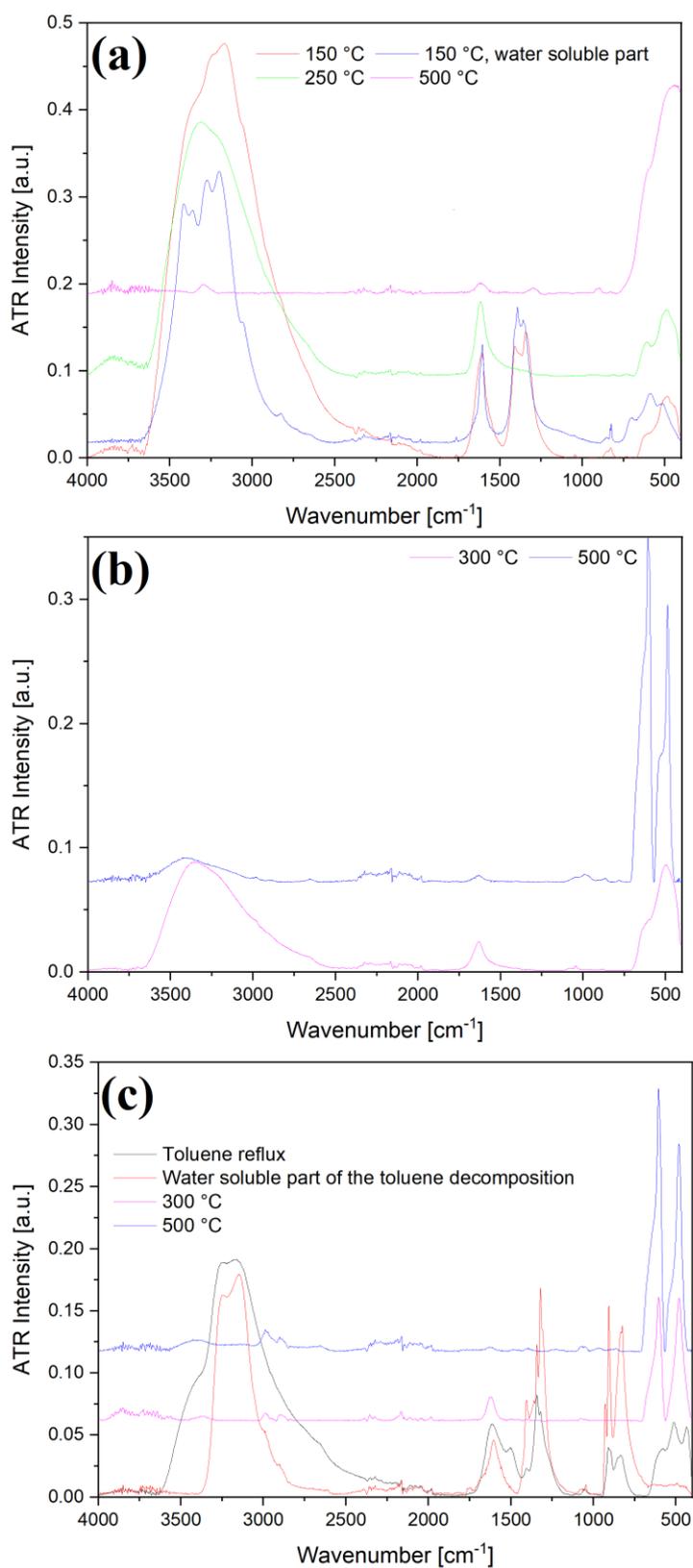


Figure S12. The IR spectra of the decomposition products prepared from compound **1** (a) in an air atmosphere, (b) in an air atmosphere without the water-soluble part, and (c) in toluene at reflux temperature with subsequent heat treatment in a furnace in an air atmosphere.