

Supplementary Material:

A new hybrid framework based on a ‘superoctahedral’ $[\text{V}_7\text{O}_6\text{F}_{30}]^{14-}$ polyanion

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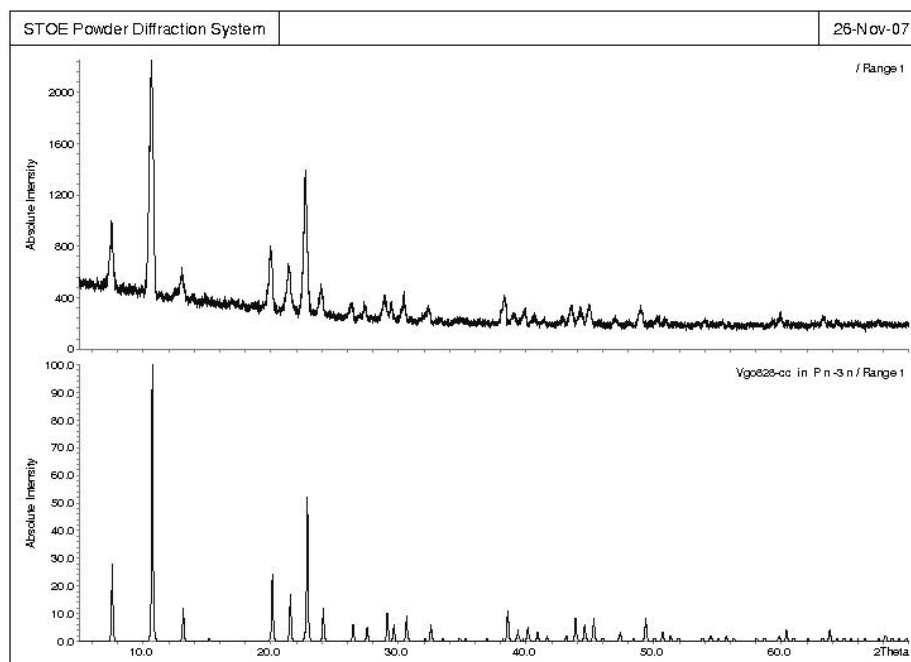
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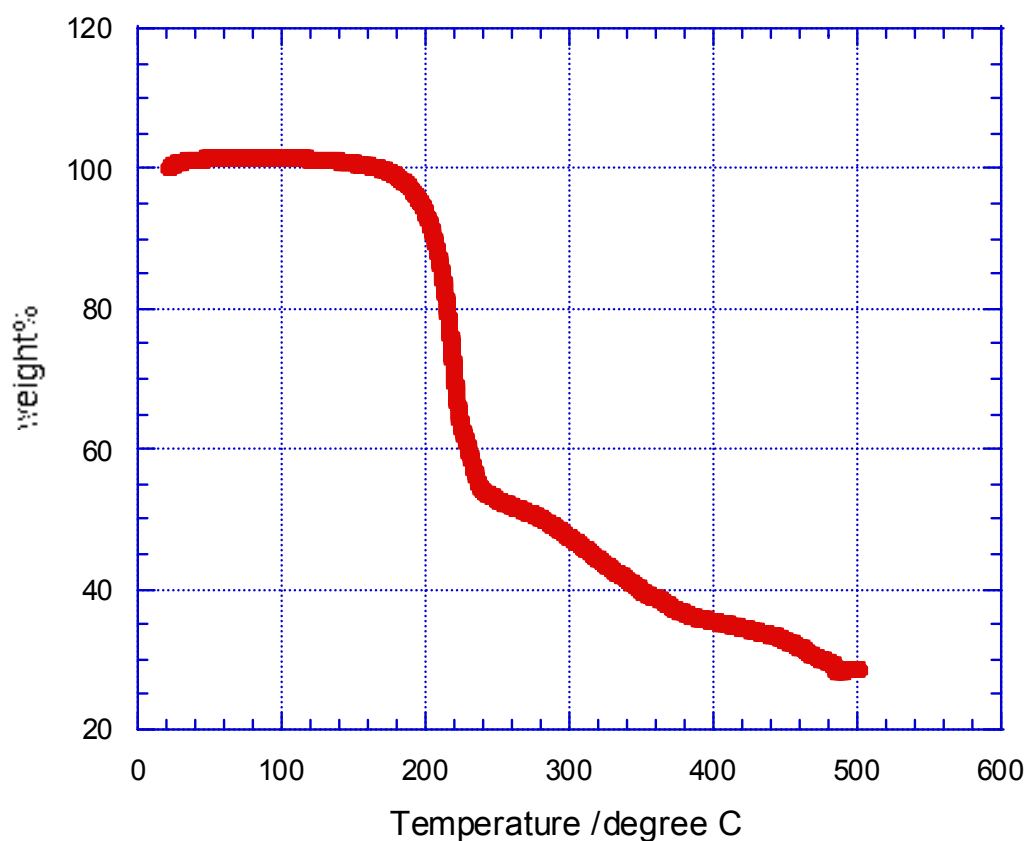
1. Powder XRD patterns of $[\text{CH}_3\text{NH}_3]_8[\text{Cu}(\text{Py})_4]_3[\text{V}_7\text{O}_6\text{F}_{30}]$
2. TGA
3. Chemical Analysis
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Powder XRD pattern of $[\text{CH}_3\text{NH}_3]_8[\text{Cu}(\text{Py})_4]_3[\text{V}_7\text{O}_6\text{F}_{30}]$

Top – experimental, Bottom - Simulated

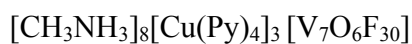


TGA of $[\text{CH}_3\text{NH}_3]_8[\text{Cu}(\text{Py})_4]_3[\text{V}_7\text{O}_6\text{F}_{30}]$



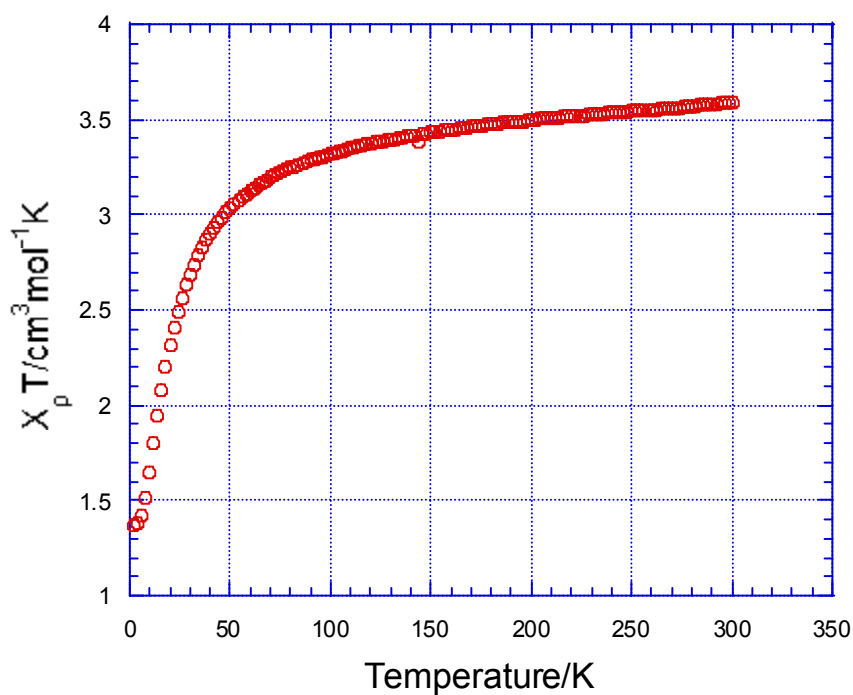
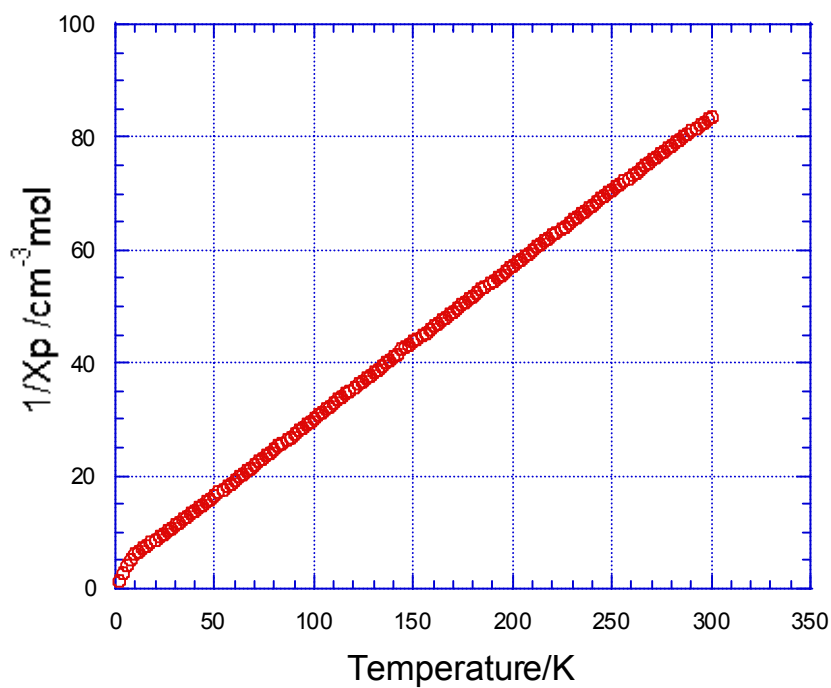
Thermogravimetric analysis exhibits a weight loss of 44.8% between 200-240 °C which corresponds to the loss of pyridine (38.4 %) and methyl ammonium (6.5 %).

Chemical Analysis



	%C	%H	%N
Theoretical composition	33.76	4.49	11.58
Result of Analysis	33.22	4.38	11.68

Magnetic measurements



**Selected Bond Distances ($\text{\AA}$), Bond Valence Sums (Σ , v.u.) and
Hydrogen bonding**

Cu1 -N1×4 2.036(3)
Cu1 -O1× 2 2.242(3)
V1 -O1 1.644(3)
V1 -F1×4 1.8963(13)
V1 -F2 2.419(3)
V2 -F2 ×6 1.943(3)

$\Sigma(\text{V1})$ 3.94
 $\Sigma(\text{V2})$ 3.11
 $\Sigma(\text{Cu1})$ 1.75
 $\Sigma(\text{O1})$ 1.65
 $\Sigma(\text{F1})$ 0.58
 $\Sigma(\text{F2})$ 0.66

Hydrogen Bonding

D-H	d(D-H)	d(H..A)	<DHA	d(D..A)	A
N2-H4	0.82(3)	2.03(3)	153(3)	2.788(2)	F1