Supporting Information for:

A new type germanium-vanadate cluster, $[Ge_5V_6O_{21}(heda)_6]$ (Hheda = *N*-(2-hydroxyethyl)ethylenediamine)

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1. Figures

2. Table S1 Selected bond lengths(Å) and angles (°).

1. Figures

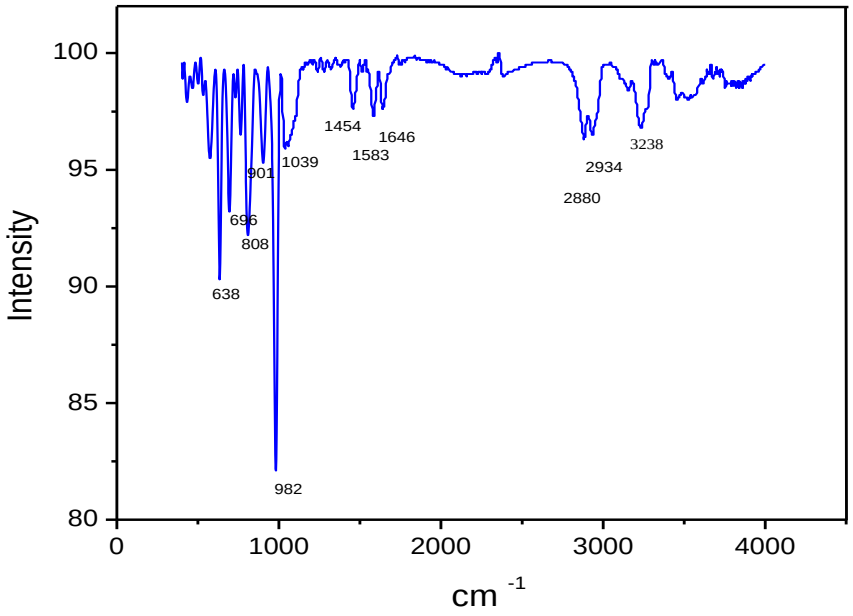

Fig. S1. IR spectrum of compound **1**..

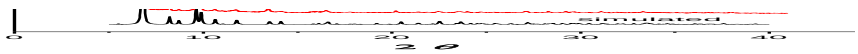

Fig. S2. XRD patterns for the experimental and calculated results of compound **1** to enssure their phase purity.

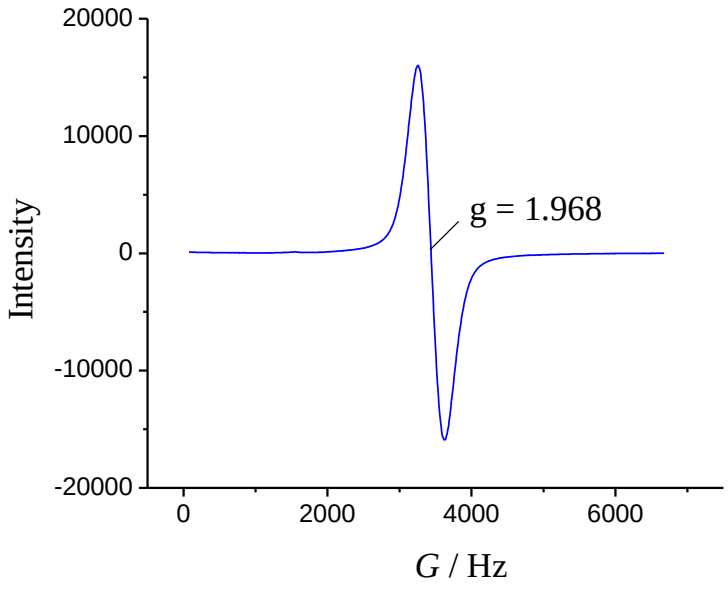

Fig. S3. EPR result of compound **1**.

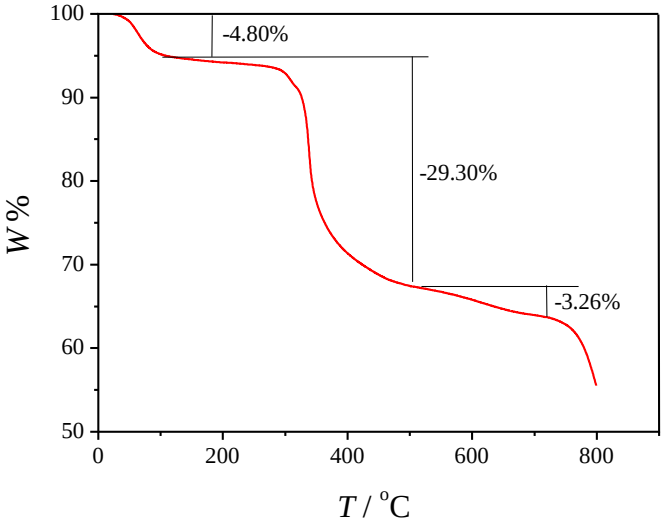

Fig. S4. TG curve for compound **1**.

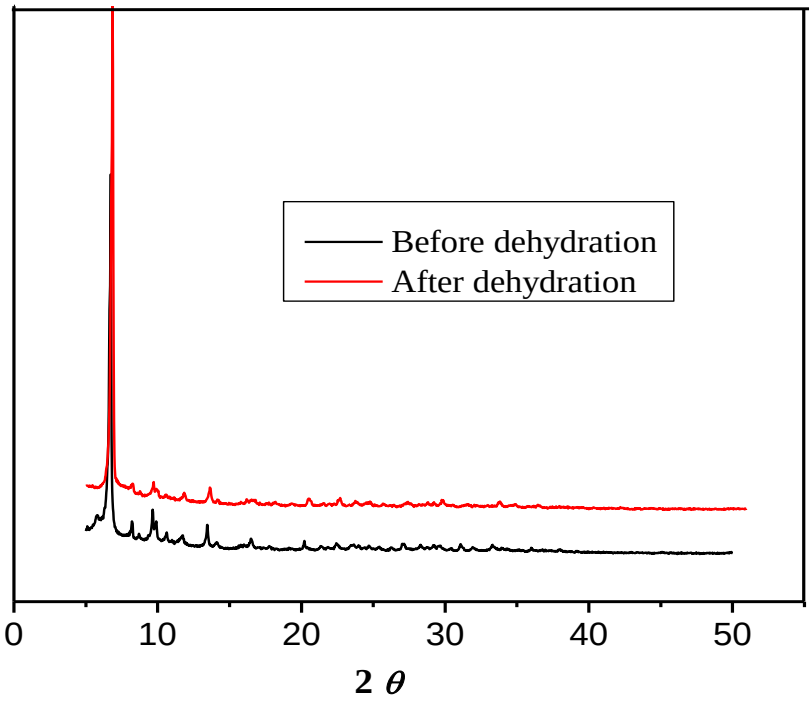

Fig. S5. The XRD patterns of the dehydrated sample of compound **1** along with the original one.

2. Table

Table S1 Selected bond lengths(Å) and angles (°).

Bond lengths (Å)					
Ge1—O3	1.730(6)	Ge1—O5	1.727(7)	Ge1—O7	1.737(7)
Ge1—O17	1.752(8)	Ge2—O4	1.772(7)	Ge2—O8	1.760(6)
Ge2—O9	1.733(7)	Ge2—O23	1.743(8)	Ge3—O1	1.728(6)
Ge3—O4	1.786(8)	Ge3—O12	1.765(7)	Ge3—O21	1.733(8)
Ge4—O2	1.888(7)	Ge4—O3	1.831(7)	Ge4—O6	1.853(7)
Ge4—O27	1.867(8)	Ge4—N5	2.105(9)	Ge4—N6	2.03(1)
Ge5—O7	1.850(6)	Ge5—O10	1.872(7)	Ge5—O13	1.884(7)
Ge5—O28	1.867(8)	Ge5—N11	2.090(9)	Ge5—N12	2.050(9)
V1—O5	2.235(7)	V1—O10	1.937(7)	V1—O11	1.609(8)
V1—O12	2.029(7)	V1—O14	2.030(7)	V1—O25	2.15(1)
V2—O1	2.300(7)	V2—O2	1.966(7)	V2—O5	1.957(7)
V2—O14	1.963(8)	V2—O15	1.609(8)	V2—N7	2.17(1)
V3—O9	1.974(8)	V3—O10	1.946(7)	V3—O12	1.999(7)
V3—O13	1.954(7)	V3—O18	1.618(8)	V4—O1	1.962(7)
V4—O2	1.961(7)	V4—O6	1.948(7)	V4—O8	2.001(7)
V4—O19	1.603(7)	V5—O9	2.294(8)	V5—O13	1.983(8)
V5—O16	1.615(8)	V5—O17	1.955(7)	V5—O20	1.962(7)
V5—N1	2.19(1)	V6—O6	1.945(7)	V6—O8	2.053(7)
V6—O17	2.247(7)	V6—O20	1.995(7)	V6—O22	1.614(8)
V6—O24	2.16(1)				
angles (°)					
O5—V1—O10	86.2(3)	O5—V1—O12	83.3(3)	O5—V1—O14	71.9(3)
O1—V2—N7	82.3(3)	O2—V2—N7	98.6(3)	O14—V2—N7	80.0(4)
O1—V2—O2	73.5(3)	O1—V2—O5	82.4(3)	O1—V2—O14	82.6(3)
O9—V3—O12	97.1(3)	O9—V3—O13	81.1(3)	O9—V3—O18	108.5(4)
O1—V4—O2	81.8(3)	O2—V4—O6	75.9(3)	O6—V4—O8	80.9(3)
O9—V5—O13	72.9(3)	O9—V5—N1	81.6(3)	O13—V5—N1	102.4(3)
O6—V6—O8	79.7(3)	O3—Ge1—O5	109.0(3)	O3—Ge1—O7	112.9(3)
O3—Ge1—O17	106.5(3)	O4—Ge2—O8	105.2(3)	O4—Ge2—O9	107.6(3)
O8—Ge2—O9	115.8(3)	O1—Ge3—O4	108.5(3)	O1—Ge3—O12	113.0(3)
O4—Ge3—O12	104.7(3)	O2—Ge4—O3	100.2(3)	O2—Ge4—O6	79.9(3)
O3—Ge4—O27	90.9(3)	O2—Ge4—N5	87.1(3)	O2—Ge4—N6	89.1(3)
N5—Ge4—N6	82.0(4)	O7—Ge5—N11	166.8(3)	N11—Ge5—N12	81.9(4)

Table S2 X⋯Y distances of hydrogen bonds (Å).*

N2⋯029w	2.865	N4⋯011	2.710	N5⋯031w	2.863
N6⋯04	2.913	N6⋯015 (in)	2.970	N10⋯030w	2.946
N10⋯031w	2.806	N12⋯07	2.990	N12⋯029w	2.932
N12⋯016 (in)	3.015	029w⋯023	2.669	030w⋯023	2.856
031w⋯018	2.886	031w⋯019	2.773		

* Because the hydrogen atoms of the water and the amine groups can not be located, only the X⋯Y distances' are listed.

w: oxygen of water; in: intra-cluster