$PbCd_2B_6O_{12}$ and $EuZnB_5O_{10}$: Syntheses, Crystal Structures and Characterizations of two New Mixed Metal Borates

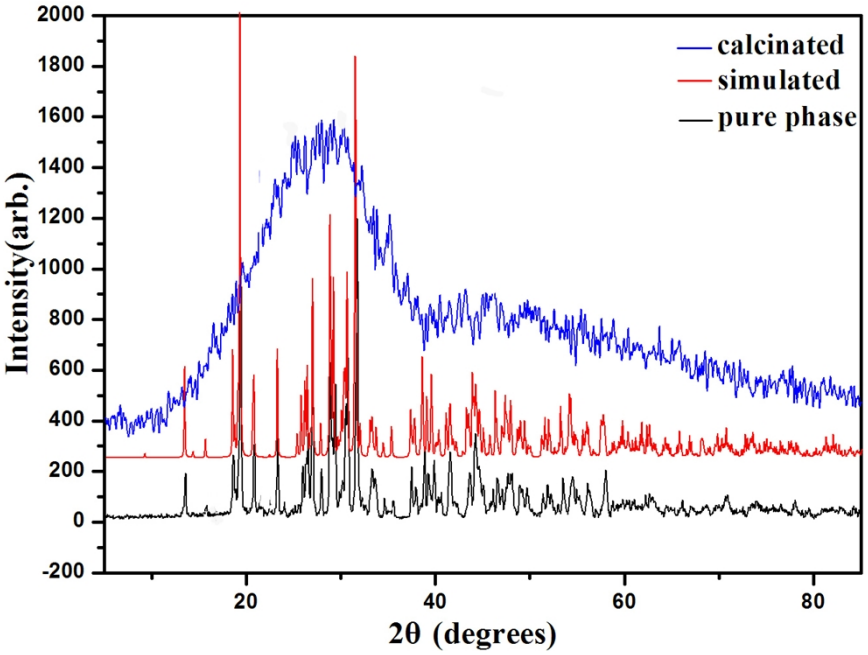
Yu-Cheng Hao,[a,b] Xiang Xu,[a] Fang Kong,[a] Jun-Ling Song,[a] Jiang-Gao Mao [a]*

[a] *State Key Laboratory of Structural Chemistry, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, 155 Yangqiao Road West, Fuzhou 350002, PR China*

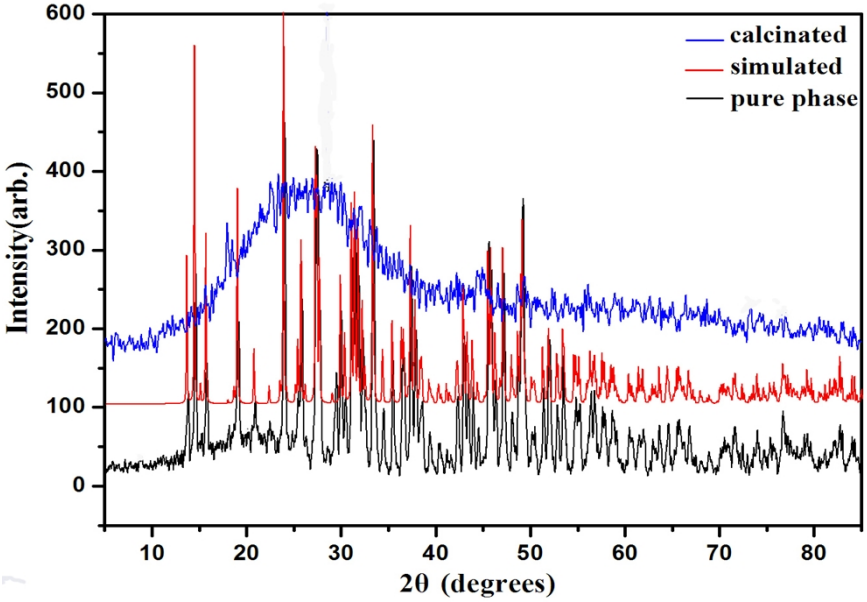
[b] *University of Chinese Academy of Sciences, Beijing, 100039, PR China*

FAX: (+86)591-83714946; E-mail: mjg@fjirsm.ac.cn

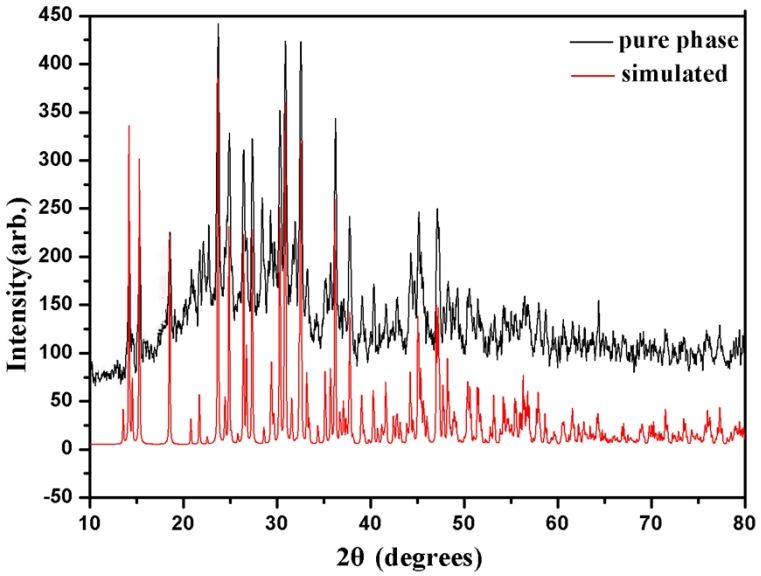
Supporting Information


calcinated
simulated
pure phase
Intensity(arb.)
2θ (degrees)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
20
40
60
80

(a)

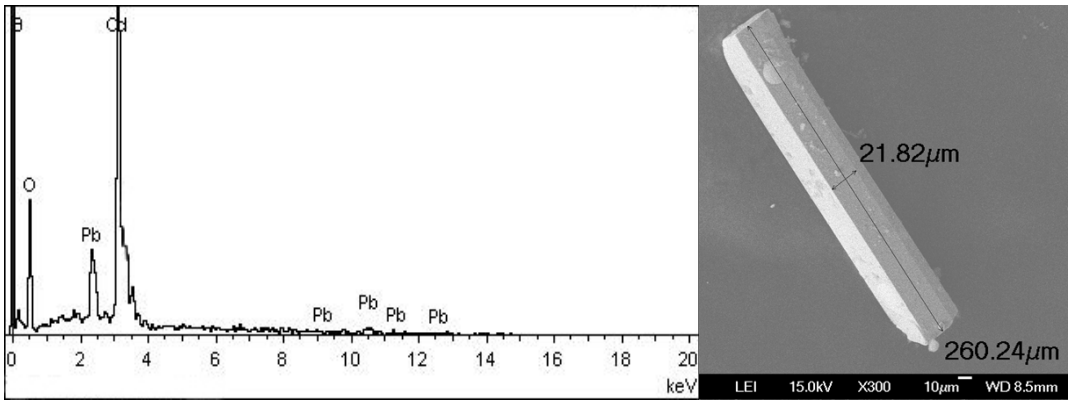

calcinated
simulated
pure phase
Intensity(arb.)
2θ (degrees)
600
500
400
300
200
100
0
10
20
30
40
50
60
70
80

(b)

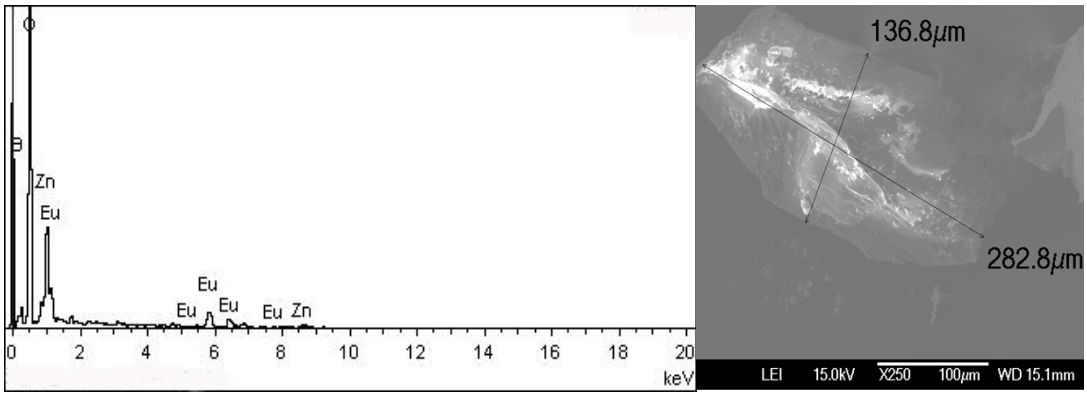


(c)

Fig. S1. Simulated and experimental XRD powder patterns for the pure phases and calcinated samples of $PbCd_2B_6O_{12}$ (a) and $EuZnB_5O_{10}$ (b); simulated and experimental XRD powder patterns for the pure phase of $EuCdB_5O_{10}$(c).



(a)



(b)

Fig. S2 The SEM images with EDX spectra of $PbCd_2B_6O_{12}$(a) and $EuZnB_5O_{10}$(b).

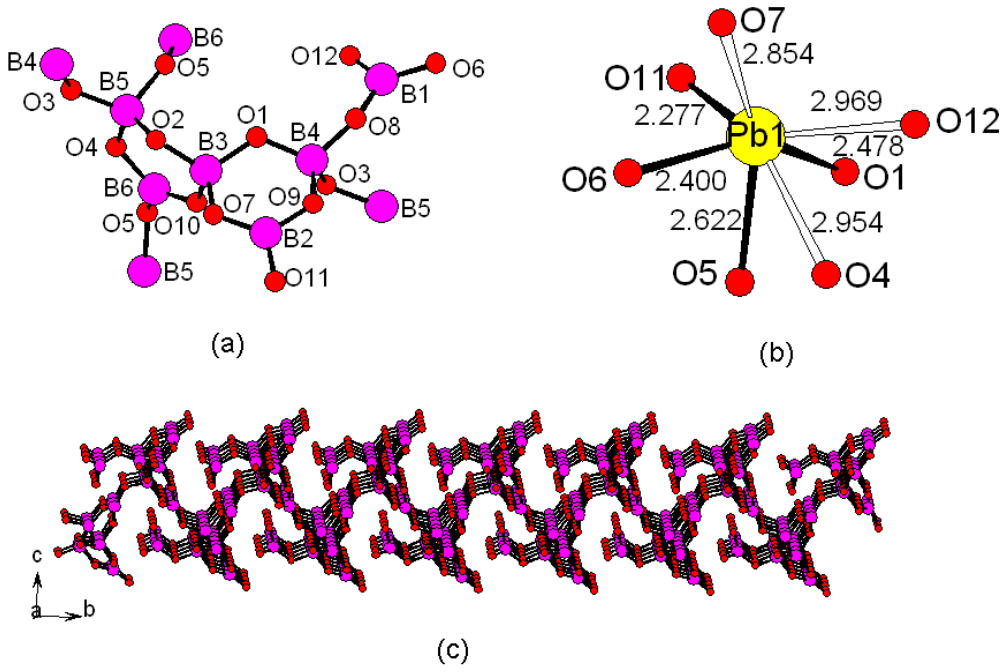
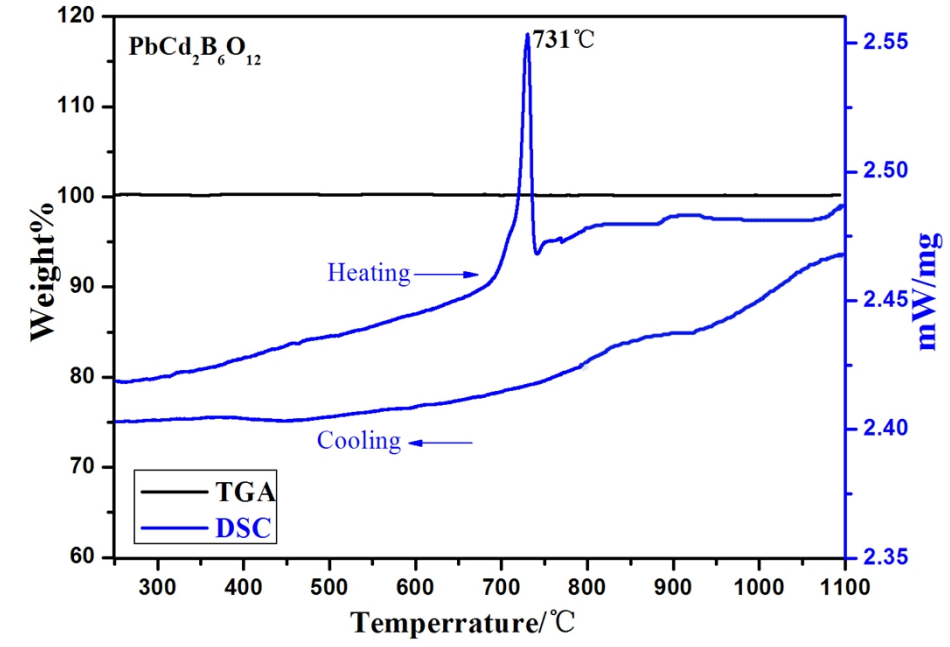
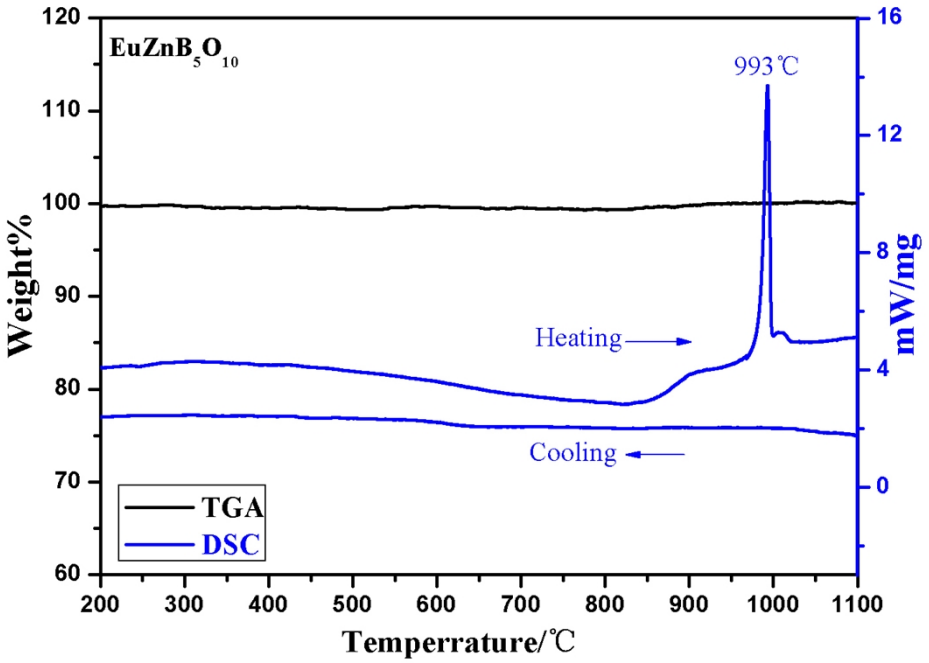


Fig. S3. The asymmetric unit of the B_6O_{16} group (a), the coordination environment around the Pb atom (b) and view of the 2D $[B_6O_{16}]^{6-}$ anion along *b* axis (c) in $PbCd_2B_6O_{12}$.

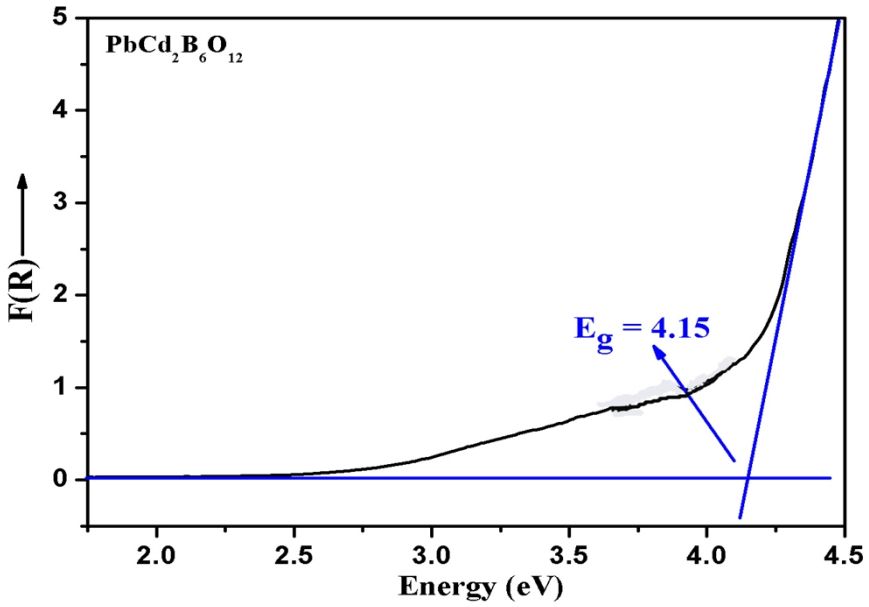


(a)

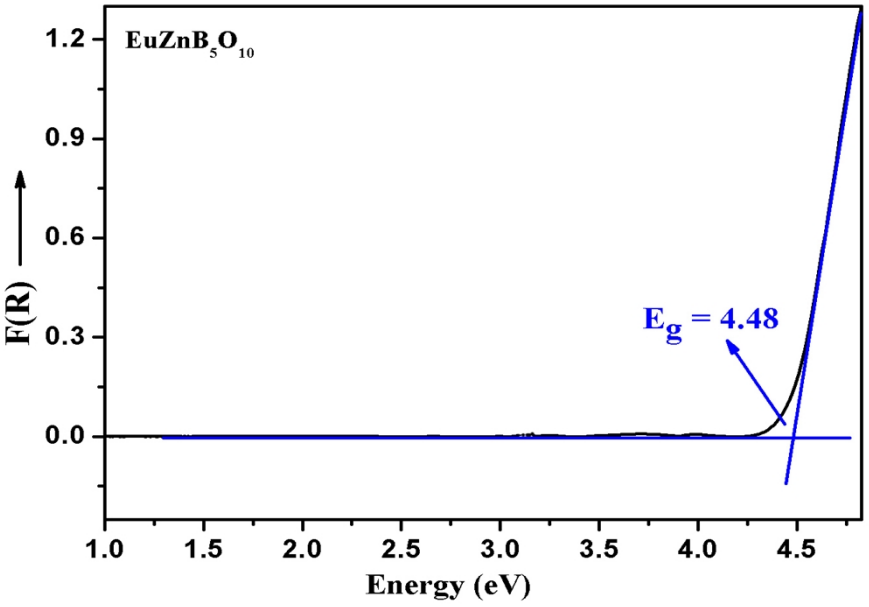


(b)

Fig. S4. TGA and DSC curves for $PbCd_2B_6O_{12}$ (a) and $EuZnB_5O_{10}$ (b).

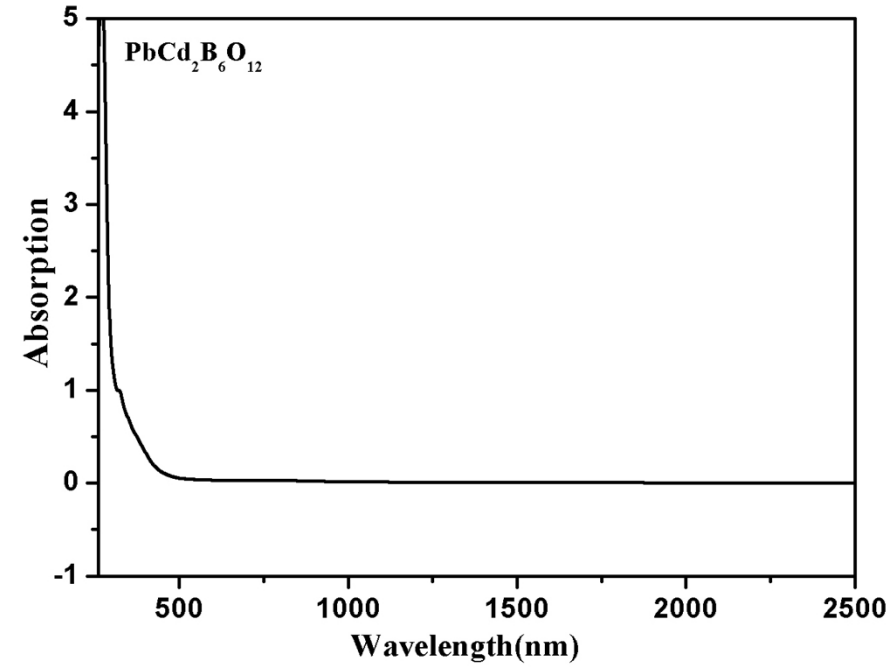


(a)

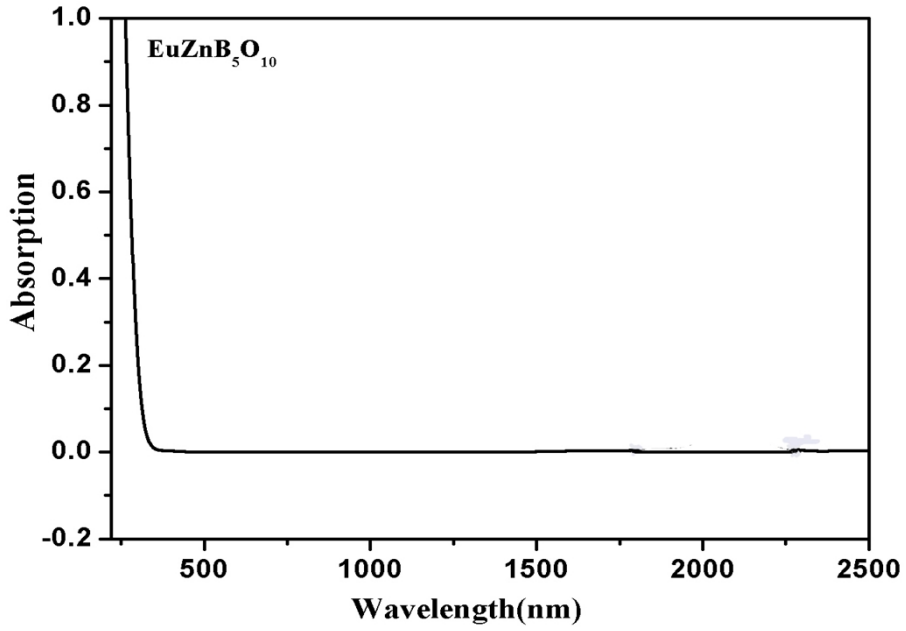


(b)

Fig. S5. Optical diffuse reflectance spectra for $PbCd_2B_6O_{12}$ (a) and $EuZnB_5O_{10}$ (b).

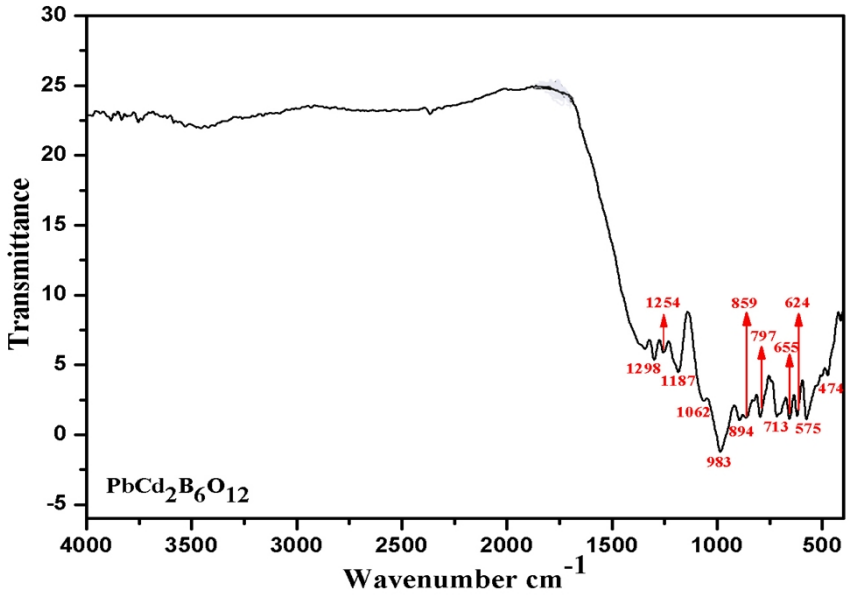


(a)

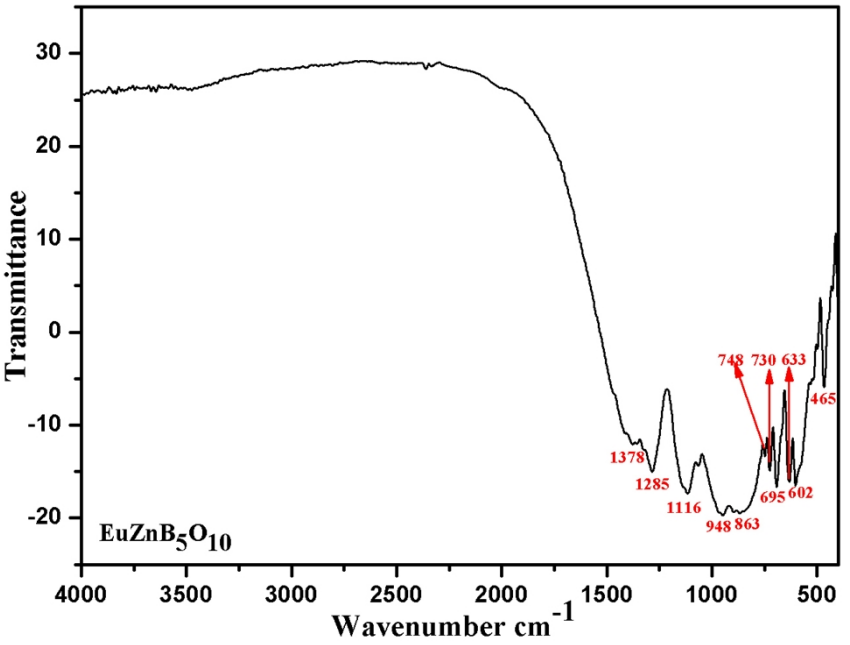


(b)

Fig. S6. UV absorption spectra of $PbCd_2B_6O_{12}$ (a) and $EuZnB_5O_{10}$ (b).

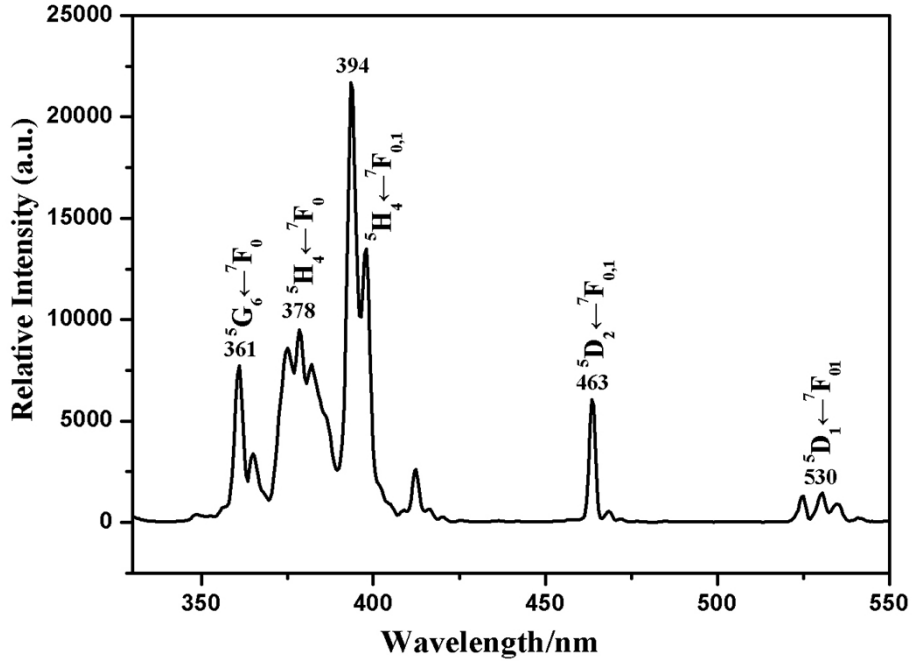


(a)

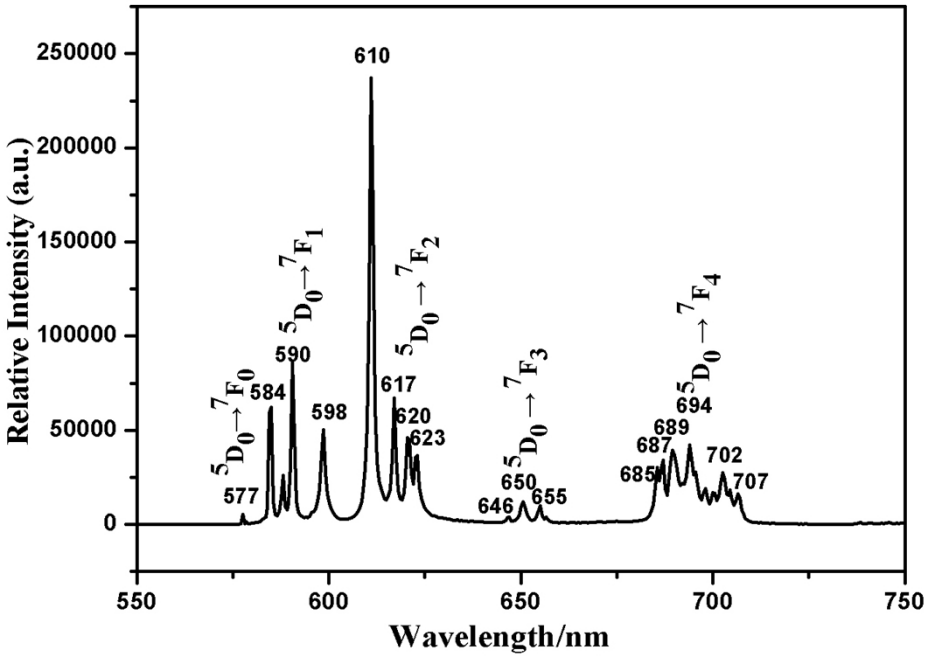


(b)

Fig. S7. IR spectra for $PbCd_2B_6O_{12}$ (a) and $EuZnB_5O_{10}$ (b).

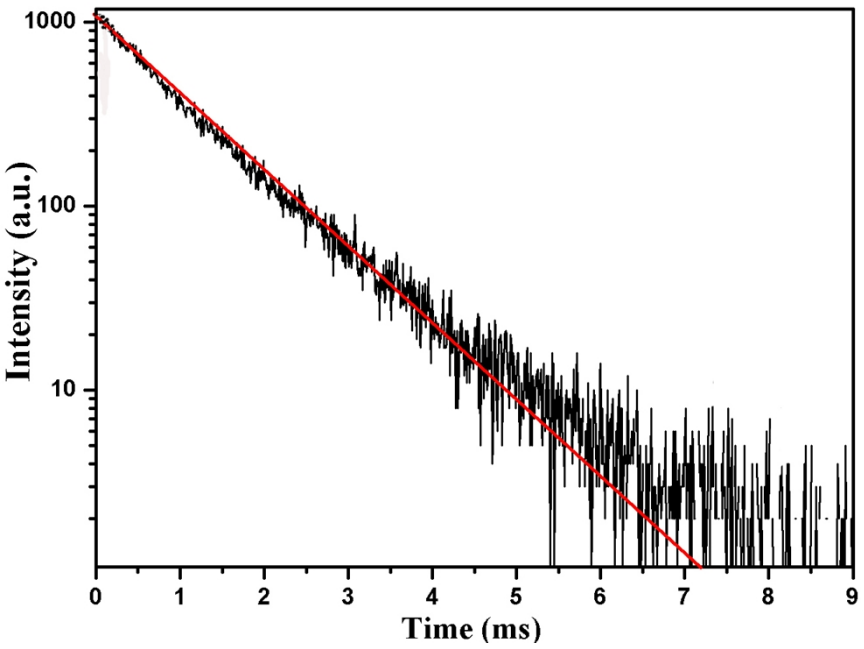


(a)

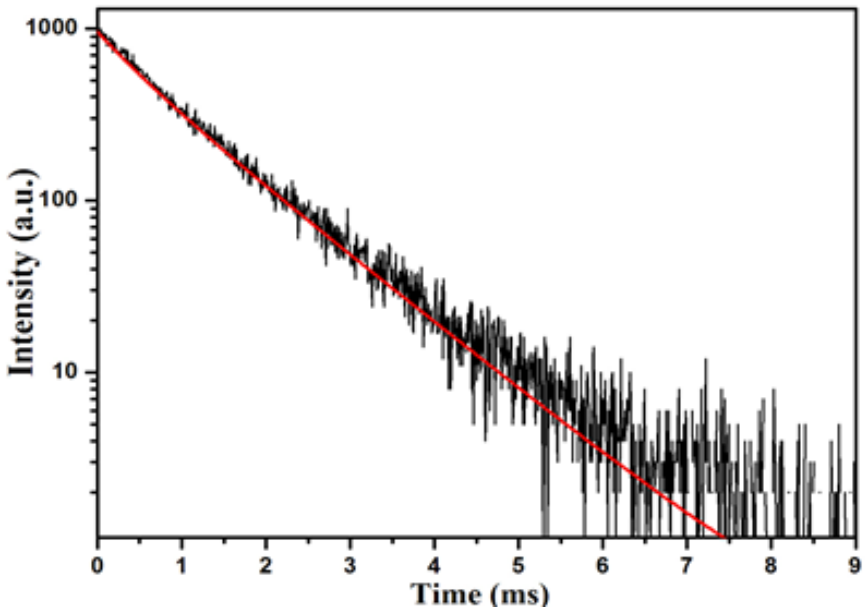


(b)

Fig. S8. Solid state excitation spectrum under emission at 608 nm (a) and the emission spectrum under excitation at 395 nm (b) for $EuCdB_5O_{10}$.



(a)



(b)

Fig. S9. Photoluminescence decay curves of $EuCdB_5O_{10}$(a) and $EuZnB_5O_{10}$(b) at RT, with an exposure time of 1s. The red line represents the linear fit of Data.