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## Supporting Information

**K<sub>2</sub>La<sub>6</sub>I<sub>12</sub>Os: A New Structure Type for Isolated Clusters That is Generated by Cation Requirements.****S. Uma and John D. Corbett\*****Table S1.** Crystallographic data for K<sub>2</sub>La<sub>6</sub>I<sub>12</sub>Os

formula weight	2624.66
crystal color, habit	Black, plate-like
crystal dimensions (mm)	0.05x0.05x0.20
space group, Z	P2 <sub>1</sub> /c(no. 14), 4
lattice parameters (Å, deg.) <sup>a</sup>	
a	9.890 (3)
b	19.319 (5)
c	10.047 (4)
β	108.69 (3)
V	1818 (1)
density (g/cm <sup>3</sup> )	4.808
μ (MoK <sub>α</sub> , cm <sup>-1</sup> )	207.81
diffractometer, radiation	Rigaku AFC6R, Mo K <sub>α</sub>
scan type	ω-2θ
octants measured, 2θ <sub>max</sub>	±h, k, ±l, 50°
measured reflections	4754
unique reflections, R(INT)	2391, 16.2%
indep. reflections, I > 3σ(I)	815
number of variables	97
absorption corrections	Empirical, 3ψ scans, DIFABS
rel. transm. coeff. range	0.851 – 1.00
largest residual peak (e/Å <sup>3</sup> )	1.52, 1.61 Å from K
R, <sup>b</sup> R <sub>w</sub> <sup>b</sup> (%)	4.2, 3.8

<sup>a</sup> Guinier powder data with Si as an internal standard, λ = 1.540 562 Å, 23 °C.<sup>b</sup> R = Σ| |F<sub>o</sub>| - |F<sub>c</sub>| | / Σ|F<sub>o</sub>|; R<sub>w</sub> = [Σw(|F<sub>o</sub>| - |F<sub>c</sub>|)<sup>2</sup> / Σw(F<sub>o</sub>)<sup>2</sup>]<sup>1/2</sup>; w = σ<sub>F</sub><sup>-2</sup>.

**Table S2.** Anisotropic Displacement Parameters<sup>a</sup> ( $\text{\AA}^2$ ) for  $\text{K}_2\text{La}_6\text{I}_{12}\text{Os}$ 

atom	$U_{11}$	$U_{22}$	$U_{33}$	$U_{12}$	$U_{13}$	$U_{23}$
Os	0.012(2)	0.005(2)	0.008(2)	0	0.003(1)	-0.001(1)
La1	0.018(2)	0.015(2)	0.016(2)	0.001(2)	0.007(2)	-0.003(2)
La2	0.022(2)	0.013(2)	0.017(2)	0.001(2)	0.006(2)	0.002(2)
La3	0.016(2)	0.019(2)	0.018(2)	-0.002(2)	0.006(2)	-0.001(2)
I1	0.025(3)	0.029(3)	0.039(3)	0.006(2)	0.004(2)	0.006(2)
I2	0.025(3)	0.063(4)	0.019(2)	-0.012(2)	0.001(2)	-0.014(2)
I3	0.020(2)	0.073(4)	0.026(2)	-0.005(2)	0.011(2)	-0.007(2)
I4	0.091(4)	0.019(3)	0.021(2)	0.008(2)	0.028(3)	0.002(2)
I5	0.087(3)	0.019(3)	0.029(2)	0.007(2)	0.027(2)	0
I6	0.033(3)	0.028(3)	0.068(4)	-0.011(2)	0.004(2)	0.011(3)
K	0.11(2)	0.08(2)	0.10(2)	-0.04(1)	0.02(1)	0.03(1)

$$^a U_{ij} = \exp\{-2\pi^2(U_{11}h^2a^{*2} + \dots + U_{23}kla^{*}c^{*})\}$$