SUPPORTING INFORMATION

Synthesis, Structure, and Bonding of the Nonclassical Zintl Phase $\text{K}_5\text{As}_3\text{Pb}_3$

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Table S1. Details of data collection and refinement for $\text{K}_5\text{As}_3\text{Pb}_3$

Formula	$\text{K}_5\text{As}_3\text{Pb}_3$
Formula Weight	1041.86
Crystal system, space group, Z	orthorhombic, Pnma, 4
Unit cell dimensions (Å)	
<i>a</i>	19.451(6)
<i>b</i>	12.164(3)
<i>c</i>	6.581(1)
<i>V</i> (Å ³)	1557.0(6)
Calculated density, g cm ⁻³	4.444
Diffractometer	Rigaku, AFC6R
Octants, 2θ _{max} (deg); °C	± <i>h</i> , ± <i>k</i> , <i>l</i> ; 55; 23
Observ. refl.	9898
unique	2652 (<i>R</i> _{int} = 0.232)
Absorp. coeff. (Mo Kα, cm ⁻¹)	400.37
Rel. trans. coeff. range	0.1839 – 1.000
variables	58
<i>R</i> , <i>R</i> _w ^a	0.032, 0.037
Largest Δ <i>F</i> , e ⁻ /Å ³	1.694, 0.86 Å from K2
GOF	1.16

$$^a R = \Sigma ||F_o| - |F_c|| / \Sigma |F_o|; R_w = [\Sigma w(|F_o| - |F_c|)^2 / \Sigma w(F_o)^2]^{1/2}; w = \sigma_F^{-2}.$$

Table S2. Anisotropic displacement parameters for $K_5As_3Pb_3$ phase^a

$K_3As_3Pb_3$	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Pb1	0.0209(5)	0.0217(3)	0.0162(3)	-0.0010(5)	0.0009(4)	0.0019(4)
Pb2	0.0177(8)	0.0289(7)	0.0219(6)	0.0	-0.0043(6)	0.0
As1	0.014(2)	0.022(2)	0.019(1)	0.0000	-0.003(2)	0.0
As2	0.017(2)	0.022(1)	0.018(1)	0.004(1)	-0.001(1)	-0.002(1)
K1	0.021(5)	0.034(4)	0.019(4)	-0.004(4)	-0.001(4)	-0.004(4)
K2	0.030(5)	0.024(4)	0.014(3)	0.0	-0.001(4)	0.0
K3	0.019(3)	0.042(3)	0.028(3)	0.003(3)	0.001(3)	0.005(3)
K4	0.040(7)	0.064(7)	0.031(4)	0.0	0.004(5)	0.0

^a
$$T = \exp [-2\pi^2 (a^2 U_{11} h^2 + b^2 U_{22} k^2 + c^2 U_{33} l^2 + 2a*b*U_{12} hk + 2a*c*U_{13} hl + 2b*c*U_{23} kl)]$$

Figure S1. Resistivity of $\text{K}_5\text{Pb}_3\text{As}_3$ as determined by the microwave Q method.