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Table S1: Crystal data and structure determination parameters for $Nb_{3.33}Ru_{2.67}Te_8$

empirical formula	$Nb_{3.33}Ru_{2.67}Te_8$
formula weight [g/mol]	1600.0
crystal system	rhombohedral
space group	$R\bar{3}$ (No.148)
lattice parameters [Å], hexagonal setting	$a = 10.34106(5)$
	$c = 11.47953(7)$
cell volume [Å^3]	1063.13(2)
Z	3
temperature [K]	298
calculated density [g/cm^3]	7.496
diffractometer	Siemens D5000 powder diffractometer
	$CuK_{\alpha 1}$-radiation, $\lambda = 1.54056$ Å,
	scintillation counter
linear absorption coefficient [1/mm]	180.19
measured angular range	$10° \leq 2\theta \leq 100°$
scan type	θ-2θ-step scan
step size [°]	0.01
step time [sec]	60
stucture refinement	Rietveld method
minimized quantity	$\Sigma w_i(y_{io}-y_{ic})^2$
number of parameters	26, thereof 12 structural parameters of
	$Nb_{3.33}Ru_{2.67}Te_8$
weighting scheme	$w = 1/y_o$
$R_B(Nb_{3.33}Ru_{2.67}Te_8)$[a]	0.046
R_{exp}[a]	0.049
R_p[a]	0.074
R_{wp}[a]	0.097
R'_p[a]	0.134
Goodness of Fit (GOF)[a]	3.96
weight percentage of the three phases	98.8/0.5/0.7
$Nb_{3.33}Ru_{2.67}Te_8/NbO_2/RuTe_2$ obtained by	
refinement	

[a] $R_B = \sum_k |I_{ko} - I_{kc}| / \sum_k I_{ko}$, $R_{exp} = \left[N - P + C / \sum_i w_i y_{io}^2\right]^{1/2}$, $R_p = \sum_i |y_{io} - y_{ic}| / \sum_i y_{io}$,

$R_{wp} = \left[\sum_i w_i \left(y_{io} - y_{ic}\right)^2 / \sum_i w_i y_{io}^2\right]^{1/2}$, $R'_p = \sum_i |y_{io} - y_{ic}| / \sum_i |y_{io} - y_{ib}|$, $w_i = 1/y_{io}$

Table S2: Atomic coordinates and isotropic thermal parameters for $Nb_{3.33}Ru_{2.67}Te_8$, hexagonal setting (standard deviations)

atom	*Wyckoff-position*	*x/a*	*y/b*	*z/c*	*B*
M[a]	*18f*	0.0152(2)	0.1616(2)	0.3969(2)	0.94(3)
Te1	*18f*	0.3231(2)	0.2878(1)	0.4111(1)	1.18(3)
Te2	*6c*	0	0	0.2070(2)	1.43(6)

[a] statistically occupied by Nb and Ru in the ratio 3.33:2.67

Table S3: Important interatomic distances [Å] for $Nb_{3.33}Ru_{2.67}Te_8$ (standard deviations)

M-Te(1)	2.710(2)	M-M[a]	2.768(3) (2×)
M-Te(1)	2.731(2)	M-M[b]	2.856(3) (2×)
M-Te(1)	2.777(2)	M-M[c]	3.665(2)
M-Te(1)	2.793(2)	M-M[d]	3.978(2)
M-Te(2)	2.703(2)		
shortest observed Te-Te-distance		3.658(2)	

[a]*d*2, [b]*d*1, [c]*d*3, [d]*d*4, see text and Fig. 2.

Table S4: Selected bond angles [°] for $Nb_{3.33}Ru_{2.67}Te_8$ (standard deviations)

Te(1)-M-Te(1)	87.85(6)	M-M-M	60.00(8)
Te(1)-M-Te(1)	86.91(6)	M-M-M	57.98(9)
Te(1)-M-Te(1)	90.18(3)	M-M-M	61.01(5) (2×)
Te(1)-M-Te(1)	173.21(5)	M-M-M	90.00(5) (2×)
Te(1)-M-Te(1)	86.63(5)		
Te(1)-M-Te(1)	97.70(4)	M-Te(1)-M	63.33(7)
Te(1)-M-Te(2)	178.80(4)	M-Te(1)-M	62.72(5)
Te(1)-M-Te(2)	93.11(3)	M-Te(1)-M	130.71(7)
Te(1)-M-Te(2)	92.08(3)	M-Te(1)-M	60.34(6)
Te(1)-M-Te(2)	90.60(4)	M-Te(1)-M	128.16(6)
		M-Te(1)-M	82.30(5)
		M-Te(2)-M	61.61(7) (3×)