Supplementary Material

1 Le Bail fitting graphs of the XRD data

The graphs of the Le Bail refinements of the powder XRD data are given in the figures below. The black crosses denote the observed, the red lines represent the refined data. The positions of Bragg reflections are plotted green; the blue lines correspond to the difference between the calculated and observed XRD patterns.

Fig S1. Le Bail refinement plot of PdTe.

Fig S2. Le Bail refinement plot of PdTe$_{1-x}$Sb$_x$ ($x = 0.05$).
Fig S3. Le Bail refinement plot of PdTe$_{1-x}$Sb$_x$ ($x = 0.1$).

Fig S4. Le Bail refinement plot of PdTe$_{1-x}$Sb$_x$ ($x = 0.12$).

Fig S5. Le Bail refinement plot of PdTe$_{1-x}$Sb$_x$ ($x = 0.15$).
Fig S6. Le Bail refinement plot of PdTe$_{1-x}$Sb$_x$ ($x = 0.17$)

Fig S7. Le Bail refinement plot of PdTe$_{1-x}$Sb$_x$ ($x = 0.2$).

Fig S8. Le Bail refinement plot of PdTe$_{1-x}$Sb$_x$ ($x = 0.3$).
Fig S9. Le Bail refinement plot of PdSb.

Fig S10. Le Bail refinement plot of Pd$_{1-y}$Te ($y = 1.96\%$).

Fig S11. Le Bail refinement plot of Pd$_{1-y}$Te ($y = 2.91\%$).
Fig S12. Le Bail refinement plot of $\text{Pd}_{1-y}\text{Te}$ ($y = 3.85\%$).

Fig S13. Le Bail refinement plot of $\text{Pd}_{1-y}\text{Te}$ ($y = 4.76\%$).

Fig S14. Le Bail refinement plot of $\text{Pd}_{1-y}\text{Te}$ ($y = 6.54\%$).
Fig S15. Le Bail refinement plot of Pd$_{1-y}$Te ($y = 7.41\%$).

2 Estimation of the lower and upper critical fields
Fig S16. (a) $M-H$ plots of PdTe at various temperatures. (b) $H_{c1}$ of PdTe against normalized $t$ is depicted and fitted using the formula $H_{c1}(T) = H_{c1}(0) \ast (1 - t^2)$. (c) $M-H$ plots of PdTe in higher fields at fixed $T_s$. (d) $H_{c2}$ of PdTe against $t$ is depicted and fitted using the formula $H_{c2}(t) = H_{c2}(0) \ast \frac{1 - t^2}{1 + t^2}$.

Fig S17. (a) $M-H$ plots of PdTe$_{1-x}$Sb$_x$ ($x = 0.05$) at various temperatures. (b) $H_{c1}$ of PdTe$_{0.95}$Sb$_{0.05}$ against normalized $t$ is depicted and fitted using the formula $H_{c1}(T) = H_{c1}(0) \ast (1 - t^2)$. (c) $M-H$ plots of PdTe$_{0.95}$Sb$_{0.05}$ in higher fields at fixed $T_s$. (d) $H_{c2}$ of PdTe$_{0.95}$Sb$_{0.05}$ against $t$ is depicted and fitted using the formula $H_{c2}(t) = H_{c2}(0) \ast \frac{1 - t^2}{1 + t^2}$.
Fig S18. (a) $M$–$H$ plots of PdTe$_{1-x}$Sb$_x$ ($x = 0.1$) at various temperatures. (b) $H_{c1}$ of PdTe$_{0.9}$Sb$_{0.1}$ against normalized $t$ is depicted and fitted using the formula $H_{c1}(T) = H_{c1}(0) \times (1 - t^2)$. (c) $M$–$H$ plots of PdTe$_{0.9}$Sb$_{0.1}$ in higher fields at fixed $T_s$. (d) $H_{c2}$ of PdTe$_{0.9}$Sb$_{0.1}$ against $t$ is depicted and fitted using the formula $H_{c2}(t) = H_{c2}(0) \times \left[\frac{1 - t^2}{1 + t^2}\right]$. 
Fig S19. (a) $M-H$ plots of PdTe$_{1-x}$Sb$_x$ ($x = 0.12$) at various temperatures. (b) $H_{c1}$ of PdTe$_{0.88}$Sb$_{0.12}$ against normalized $t$ is depicted and fitted using the formula 

$$H_{c1}(T) = H_{c1}(0) \times (1 - t^2).$$

(c) $M-H$ plots of PdTe$_{0.88}$Sb$_{0.12}$ in higher fields at fixed $T_s$. (d) $H_{c2}$ of PdTe$_{0.88}$Sb$_{0.12}$ against $t$ is depicted and fitted using the formula 

$$H_{c2}(t) = H_{c2}(0) \times \frac{1 - t^2}{1 + t^2}.$$
Fig S20. (a) $M$–$H$ plots of PdTe$_{1-x}$Sb$_x$ ($x = 0.15$) at various temperatures. (b) $H_c$ of PdTe$_{0.85}$Sb$_{0.15}$ against normalized $t$ is depicted and fitted using the formula

$$H_{c1}(T) = H_{c1}(0) * (1 - t^2)$$

(c) $M$–$H$ plots of PdTe$_{0.85}$Sb$_{0.15}$ in higher fields at fixed $T_s$. (d) $H_{c2}$ of PdTe$_{0.85}$Sb$_{0.15}$ against $t$ is depicted and fitted using the formula

$$H_{c2}(t) = H_{c2}(0) * \left[ 1 - \frac{t^2}{1 + t^2} \right].$$
Fig S21. (a) $M$–$H$ plots of PdTe$_{1-x}$Sb$_x$ ($x = 0.17$) at various temperatures. (b) $H_{c1}$ of PdTe$_{0.83}$Sb$_{0.17}$ against normalized $t$ is depicted and fitted using the formula $H_{c1}(T) = H_{c1}(0) \ast (1 - t^2)$. (c) $M$–$H$ plots of PdTe$_{0.83}$Sb$_{0.17}$ in higher fields at fixed $T_s$. (d) $H_{c2}$ of PdTe$_{0.83}$Sb$_{0.17}$ against $t$ is depicted and fitted using the formula $H_{c2}(t) = H_{c2}(0) \ast \frac{1 - t^2}{1 + t^2}$. 