Thermoelectric studies and magnetic behaviour of the new dichalcogenides $Rh_{1-x}Pd_xTe_2$, $Ir_{1-x}Pd_xTe_2$ and $Rh_{1-x}Ir_xTe_2$ with $(0 \leq x \leq 1)$

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We synthetized the three new dichalcogenides families $Rh_{1-x}Pd_xTe_2$, $Pd_{1-x}Ir_xTe_2$ and $Rh_{1-x}Ir_xTe_2$ in vacuum evacuated quartz ampoule and cooling by quenching. All the compounds show a P-3m1 (SG 164) hexagonal rearrangement. The compound $IrTe_2$ show a *reversible structural transition* near to 200K (P-3m1 to P-1) [1-12] monitored by X-ray diffraction by light synchrotron. SEM images show “small bubbles” in the crystals of the compounds that contain only Te, this can be interpreted as a small excess of Te not detected for X-ray techniques. We report thermoelectric properties for all the compounds. The electrical resistivity (ρ) for the compounds shows a Fermi liquid behavior in the temperature range (4-300K). Seebeck coefficient (S) data indicate hole-type carriers and 10^{22} carrier concentration. The electronic thermal conductivity (κ_e) was determined by Wiedemann-Franz law. The merit figure (ZT) determines regular thermoelectric materials and those are due to the fact that the carrier concentration is greater than the ideal to have a very good thermoelectric material. The magnetic measurements (χ vs T) show a Pauli paramagnetism behavior with strong interactions electron-phonon characteristic of metals.

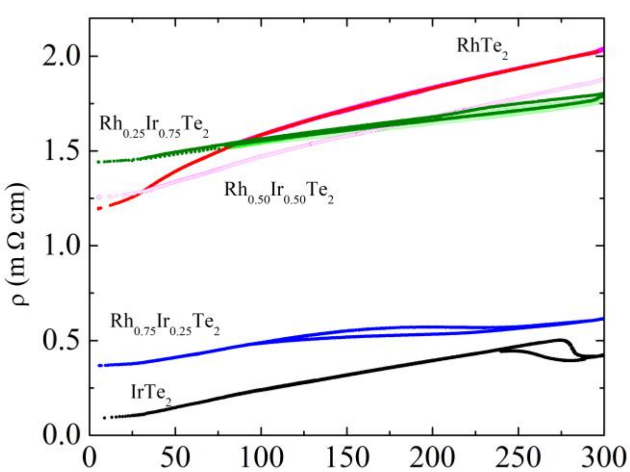

Figure 1. Electrical resistivity vs temperature for the family $Rh_{1-x}Ir_xTe_2$.

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