

# Single crystal growth and magnetism of the novel $\text{U}_2\text{RhIn}_8$ compound

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We report on the physical properties of the novel compound  $\text{U}_2\text{RhIn}_8$ . Single crystals have been prepared for the first time using In self-flux method. The compound adopts the  $\text{Ho}_2\text{CoGa}_8$ -type structure with lattice parameters  $a = 4.6163 \text{ \AA}$  and  $c = 12.0144 \text{ \AA}$ . In contrast to its nonmagnetic analog  $\text{U}_2\text{RhGa}_8$ ,  $\text{U}_2\text{RhIn}_8$  orders antiferromagnetically below  $T_N = 117 \text{ K}$  with slightly enhanced Sommerfeld coefficient  $\gamma = 47 \text{ mJ.mol}^{-1}.\text{K}^{-2}$ . The behavior of  $\text{U}_2\text{RhIn}_8$  strongly resembles that of related  $\text{URhIn}_5$  with respect to magnetization and resistivity. The susceptibility  $\chi(T)$  reveals strong anisotropy with effective magnetic moment corresponding roughly the free U ion. Additionally, an unusually large Curie temperature is found, reaching almost  $-800 \text{ K}$  for  $H \parallel a$ . The weak temperature dependence of  $\chi(T)$  might be attributed to the mainly itinerant nature of  $5f$  electrons. Magnetic field leaves the evolution of  $T_N$  unaffected up to  $14\text{T}$ , but  $T_N$  is enhanced upon applying hydrostatic pressure. The overall phase diagram will be discussed in the context of magnetism in  $\text{URhX}_5$  and  $\text{UX}_3$  ( $X = \text{In}, \text{Ga}$ ).