

MgRhD_{1-x}, A New Interstitial Deuteride Containing Square Planar [Rh₄D₄] Rings with Nearly Linear Rh – D – Rh Bridges*

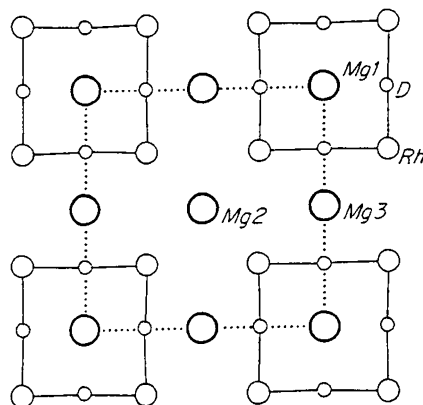
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The title compound was investigated by neutron powder diffraction at various deuterium pressures. It has metallic character and crystallizes with a tetragonally deformed CsCl-type metal arrangement (MgRhD_{0.94(2)}: space group *P* 4/*mmm*; *Z* = 4, *a* = 6.395(1) Å, *c* = 3.2368(7) Å at *p* = 39 bar *D*₂ and *T* = 298 K). The rhodium atoms are connected to four-membered



Structure of MgRhD_{1-x} projected along the tetragonal axis; large circles: magnesium at *z* = 0; small circles: rhodium and deuterium at *z* = 1/2. The occupancy of the deuterium site is 94% (*p* = 39 bar), 86% (*p* = 2.5 bar), 61% (*p* = 10⁻⁵ bar).

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planar rings via deuterium atoms with bond distances $[\text{Rh}-\text{D}] = 1.708(4) \text{ \AA}$ and bond angles $[\text{D}-\text{Rh}-\text{D}] = 87.5(7)^\circ$ and $[\text{Rh}-\text{D}-\text{Rh}] = 177.5(9)^\circ$. Two thirds of the magnesium atoms are bonded to deuterium at distances in the range $[\text{Mg}-\text{D}] = 2.23-2.33 \text{ \AA}$.