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Magnetic Properties of Cobalt–Titanium Alloys with the CsCl–Type Structure*

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Abstract

X-ray diffraction and magnetic studies have been made on the intermetallic compound CoTi. X-ray diffraction studies indicate that $\text{Co}_{1+x}\text{Ti}_{1-x}$ with the CsCl-type structure has the single-phase ranging from about 44.5 ($x=0.110$) to 50.0 at.%Ti($x=0$). According to magnetic measurements, the stoichiometric CoTi appears to be Pauli paramagnetic, whereas in nonstoichiometric cobalt-excess composition an appreciable increase in magnetic susceptibility is observed at low temperatures, which may be attributed to the appearance of magnetic moment in this composition range. The magnetic moment estimated from the observed Curie constant is nearly proportional to x , therefore it may be concluded that the magnetic moment belongs to the excess cobalt atom, which is assumed to be substituted with the titanium atom in the equiatomic composition.

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