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""4. Aluminium Substituted Single Crystals""""4.1. Growth of Mg1a??xAlxB2 Single Crystals""; ""4.2. Experimental Data for Mg1a??xAlxB2 Single Crystals""; ""5. Carbon Substituted Single Crystals""; ""5.1. Growth of MgB2a??xCx Single Crystals""; ""5.2. Experimental Data for MgB2a??xCx Single Crystals""; ""6. Conclusion""; ""Acknowledgments""; ""References""; ""NANOCRYSTALLINE MICROSTRUCTUREOF MECHANICALLY ALLOYED MGB2SUPERCONDUCTOR PRECURSOR POWDERFOR BULK AND TAPE FABRICATIONAND IMPLICATIONS ON THE SUPERCONDUCTIVITY""; ""Abstract""; ""Introduction""; ""Experimental""; ""Results""
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Sommario/riassunto

Magnesium diboride (MgB2) is an inexpensive and simple superconductor. Its superconductivity was announced in the journal 'Nature' in March 2001. Its critical temperature of 39 K is the highest amongst conventional superconductors. This material was first synthesized and its structure confirmed in 1953 but its superconducting properties were not discovered until half a century later. Though a conventional (phonon-mediated) superconductor, it is a rather unusual one. Its electronic structure is such that there exist two types of electrons at the Fermi level with widely differing behaviours, one of them being much more strongly superconducting than the other. This is at odds with usual theories of phonon-mediated superconductivity which assume that all electrons behave in the same manner. For this reason, theoretical understanding of the properties of MgB2 has not yet been achieved, particularly so in the presence of a magnetic field. This new book presents leading research in this field.