

Magnetic and magnetocaloric properties of promising materials for liquefaction cryogenic gases.

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Considerable progress in the development of materials for room-temperature magnetic refrigeration has renewed interest to the materials which are perspective for cryogenic gases liquefactions. Numerous studies have identified a large variety of materials which exhibit a sizable magnetocaloric effect (MCE) in a temperature region of interest, from 15 to 150 K [1]. Almost all these materials are rare-earth-based intermetallic compounds RTX , R_5T_4 , R_3T , and RT_2 (R is a rare-earth metal, T is a 3d or 4d transition metal and X is the main group chemical element). Considering rapid development of superconducting magnets which can generate magnetic fields of 15 – 22 T, study of MCE in high magnetic fields is of considerable interest for the development of perspective technologies for cryogenic magnetic refrigeration. In this sense, there is a need to revisit magnetocaloric properties of the rare-earth-based intermetallic compounds and to study them in a wider range of applied magnetic fields. In this work we report on the results of investigation of magnetic and magnetocaloric properties of R_5T_4 alloy.

References:

[1] H. Zhang, et al., *Physica B* 558, 65 (2019)

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