Magnetization Of Rare-Earth Based High Temperature Superconductors

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Abstract

We have measured the magnetic hysteresis loops for both \( \text{YBa}_2\text{Cu}_3\text{O}_7 \) and \( \text{GdBa}_2\text{Cu}_3\text{O}_7 \) samples in case of zero field cooling. We also compute the variation of \( (M^*) \) with temperature \( T \) and \( (H^*) \), and compute the variation of \( (H^*) \) with \( T \) for \( \text{GdBa}_2\text{Cu}_3\text{O}_7 \) and \( \text{YBa}_2\text{Cu}_3\text{O}_7 \) samples. All these variations were non linear for temperatures below \( T_c \), except the first one which is linear.

The critical temperature \( T_c \) was determined from magnetization measurements versus temperature at constant fields in a temperature range including \( T_c \). We found that the age of the sample has a dominant role in weakening its magnetic properties.