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Title: A magnetocaloric study on the series of 3d-metal chromites ACr_2O_4 where A = Mn, Fe, Co, Ni, Cu and Zn

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Abstract: The 3d-metal chromites ACr_2O_4 where A is a magnetic ion, show the paramagnetic to ferrimagnetic phase transition at T_C while for non-magnetic A-site ion, ACr_2O_4 show paramagnetic to antiferromagnetic phase transition at T_N . In this report, we present the detailed study of magnetic and the magnetocaloric effect (MCE) of the 3d-metal chromites ACr_2O_4 (where A = Mn, Fe, Co, Ni, Cu, and Zn) near T_C and T_N . We find the magnitude of MCE ($-\Delta SM$) decreases on decreasing the magnetic moment of A-site ion with an exception for $CuCr_2O_4$. Additionally, to know more about the order and nature of phase transition, we have made a scaling analysis of ($-\Delta SM$) for all the chromites across the phase transition temperatures T_C and T_N .

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