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Borate Based Spintronic Materials in Bulk Form above Room Temperature

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Abstract — Magnetization above room temperature (RT) is a necessary parameter for achieving practical application of spintronic devices. Magnetization above room temperature in bulk form has been achieved in nanocrystalline Mn-doped ZnO dispersed in borate matrix. A simple glass-ceramic route has been used for the preparation of these materials. The material-processing route used here is cheaper and easier than other routes used frequently. X-ray diffraction (XRD) study reveals that the Mn-doped ZnO was in nanocrystalline form. Since these nanocrystals are dispersed in a glass matrix, they will be protected from agglomeration, so size will remain controlled, which affects the magnetization. There are no possibilities of an extrinsic origin such as ferromagnetic impurity segregation, etc. for this magnetization.