

Internal Webinar

Study of Interstitial Transition Metal Compound Thin Films

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Numerous ferromagnetic electrode materials with a larger spin polarization ratio and tunneling magnetoresistance (TMR) have been actively investigated for their spintronic applications. In this scenario, an interesting class of promising electrode materials, tetra-transition metal nitrides (M_4N ; $M = Fe, Co, Ni$ etc.) have recently occupied a privileged position. M_4N is reported to exhibit half-metallicity, high magnetization, ultra-high TMR and tunable magnetic anisotropy with an electric field [1]. All these prerequisite merits make M_4N compounds an exceptional class of candidates for the next-generation spintronics technologies. However, some prominent issues are present in these M_4N compounds which limit their applications and that need to be sought. For instance, a large variation in the magnetic behavior in well-established Fe_4N thin films can be seen from the available literature. In this view, we have addressed the unsolved issues present in M_4N compounds and attempted to scrutinize them. In this work, a detailed and systematic investigation on the magnetic, structural and electronic properties of transition metal nitride thin films has been carried out.

References:

[1] Nidhi Pandey *et.al.*, Physical Review Materials 3, 114414 (2019).

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