

Applications of Metallic Glass utilizing Soft Magnetic Properties

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In this talk I will be concerned with the soft magnetic properties of metallic glass. The term soft refers to the fact that the response of the magnetization to an applied field is large. This large response of the magnetization is desirable in applications as transformers and inductors. Metallic glass has excellent soft magnetic properties such as low coercivity H_c , modest anisotropy constant K_u , and almost zero magnetostriction λ . The source of "soft" magnetic properties of metallic glass will be discussed in aspect to magnetic domain theory.

Another application utilizing soft magnetic properties of metallic glass is Magnetic Tunnel Junctions (MTJs). MTJs have to possess a low switching field (H_{sw}) down to submicrometer size keeping a large tunneling magnetoresistance (TMR) without degrading switching characteristics. Amorphous ferromagnetic $Co_{75}Si_{15}B_{10}$ were introduced as the free layer for MTJs and compared to MTJs with polycrystalline CoFe and NiFe free layers. The details of various perpendicular magnetic anisotropy parameters dependence of H_c , K_u , and M_s will be discussed

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