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### Influence of Mn substitution on magnetoresistance and magnetic properties of $(\text{Fe}_{1-x}\text{Mn}_x)_{75}\text{P}_{15}\text{C}_{10}$ alloy ribbons

Magnetic properties have been measured on a rapidly cooled melt spun  $(\text{Fe}_{1-x}\text{Mn}_x)_{75}\text{P}_{15}\text{C}_{10}$  ( $x=0, 0.05, 0.1, 0.2$  and  $0.3$ ) amorphous alloys ribbons. The amorphous property of the ribbons have been confirmed by X-ray diffraction and scanning electron microscopy analysis. The observed magnetic properties e.g. magnetization and magnetoresistance and the ac permeability indicate that  $(\text{Fe}_{1-x}\text{Mn}_x)_{75}\text{P}_{15}\text{C}_{10}$  goes through a transition from the ferromagnetic to antiferromagnetic-like phase within the temperature range of observation. Both positive and negative magnetoresistance have been observed at room temperature for different electrical circuit configurations as a function of the applied magnetic field. Saturation magnetization ( $M_s$ ) and the low field coercivity ( $H_c$ ) at room temperature indicates the magnetic softness of the alloy. The temperature dependent ac permeability shows high effective permeability at room temperature and shows a permeability minima around 450K. The ac permeability shows a maximum around 1kHz and diminishes at the high-frequency regime. The magnetoresistance of all the samples goes through a minimum around 4kOe showing a spin-valve type behavior which may be attributed to the suppression of quantum localization of the spin moments.

### Biography

Feroz Alam Khan has completed his PhD degree from the Bangladesh University of Engineering and Technology (BUET) and his Postdoctoral Research at the University of Delaware, USA, University of Uppsala, Sweden, and the University of Tsukuba, Japan. He is a Professor in Physics at the Bangladesh University of Engineering and Technology (BUET). He is a leader of a research group called Dhaka Materials Science Group under a scientific research collaboration with the International Science Programs (ISP), Uppsala University, Sweden. He has supervised more than 25 postgraduate degrees that include Masters, MPhil, and PhD degrees. He has to his credit more than 50 research publications. He is involved in promoting basic science research through the establishment of regional research collaborations with the south-east Asian Universities under the umbrella of International Science Programs.

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