

Pinning Layer for Magnetic Devices

Abstract

The present invention concerns at least an antiferromagnetic layer, which is in direct contact with a ferromagnetic layer for inducing an exchange bias in the ferromagnetic layer. Thus, the ferromagnetic layer is pinned by the antiferromagnetic layer, also referred to as the pinning layer. The antiferromagnetic or pinning layer comprises a compound from the group of orthoferrites, which show a variety of advantages. For example, these antiferromagnets can have a Néel temperature T_N ranging from at least 623K to 740K depending on the compounds, and they can display a weak ferromagnetic moment. Therefore, a magnetic device comprising the mentioned structure can be used properly in an environment of a high operating temperature. The compound can be described by the formula $RFe_{1-x}TM_xO_3$ with R being a rare earth element or Yttrium, and TM being a transition metal which can be one element of the groups IB to VIII. The compound can be also doped by an element S being an element with another valence, such as Barium, Nickel, Strontium, Calcium, Potassium, or Sodium in compound $R_{1-x}S_xFeO_3$



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