Cross-Sectional Views of a Vacuum Deposited Co-Cr Film

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These micrographs show TEM cross-sectional views of a vacuum deposited Co-Cr film; bright field image (Photo (a)), dark field image (photo (b)). It can be seen that columnar grains, which are regarded as hcp single crystals, grow from the boundary with a Ti underlayer to the film surface in almost a uniform diameter. These columns are characterized by dense stacking faults of the basal plane (hcp c-plane). This enables understanding that hcp columns contact each other through very thin grain boundaries without any detectable voids or secondary phases such as a sigma phase.

This columnar structure is believed to promote coherent magnetization reversal throughout the film thickness and results in a high reproduced voltage.