reduced the wavelength at which the polar Kerr rotation peaked by reducing the platinum concentration in the alloy. A reduction in platinum concentration from 21 to 6 per cent resulted in the peak polar Kerr rotation moving from 633 to 528 nm without any alteration in the peak polar Kerr rotation of 1.0°. Unfortunately this alloy did not possess magnetic properties suitable for magneto-optical storage applications. However it was suggested that perpendicular magnetisation could be induced in these alloys by manufacturing samples having their *c*-axis perpendicular to the film plane, since in this material the direction of easy magnetisation is along the *c*-axis.

Perpendicular Recording Applications

The potential of palladium/cobalt multilayers as a material for perpendicular magnetic memory storage was demonstrated in a paper by B. M. Lairson from Rice University, Texas, and J. Perez and C. Baldwin from Censtor Corporation, San Jose, California. They compared palladium/cobalt multilayers with conventional cobalt-chromium alloys and found that the palladium/cobalt multilayers had a number of advantages, including the larger signal which is read back from the information stored when using palladium/cobalt multilayers. The multilayer properties of palladium/cobalt can be easily modified to match a particular data recording head, and the multilayers do not require the use of a high temperature deposition process to produce the desired properties.

Platinum-cobalt alloys were also reported to have potential as a future perpendicular recording media by T. Hikosaka, T. Komai and Y. Tanaka from Toshiba R. & D. Center, Kawasaki, who produced platinum-cobalt alloys with large perpendicular anisotropies and coercivities by sputter deposition.

They obtained these properties by adding oxygen to the high pressure (30 mTorr) sputtering gas to produce a material in which the platinum-cobalt alloy grains were separated by amorphous oxide boundaries. The oxygen rich boundaries magnetically help to isolate the grain, which produces the large perpendicular anisotropy and coercivity of the material.

Conclusions

The results presented at this conference showed that both platinum- and palladium-containing materials have potential applications as magnetic data storage materials, in both magneto-optical and perpendicular recording applications. The publication of the full conference proceedings will be split between the *Journal of Applied Physics* and the *IEEE Transactions on Magnetics* later this year. J.M.

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Pretreatment of Titanium for Platinum Plating

A variety of electrochemical processes make use of platinum plated titanium electrodes. Before an adherent coating can be deposited onto the titanium, however, the tenacious oxide layer must first be removed, this being especially important if the thickness of the platinum deposit is to be greater than 2 to 3 micrometres, as is generally required for industrial use.

In a recent article M. Pushpavanam and S. R. Natarajan of the Central Electrochemical Research Institute, Karaikudi, India, describe experiments carried out to identify a titanium pretreatment procedure that would facilitate the direct electrodeposition of platinum from a dinitrosulphato platinous acid (DNS) system at pH 2–3 (*Met. Finish.*, 1994, **92**, (6), 85–87, 157).

Eight different etchant compositions were considered in the experimental programme and their performance assessed in terms of deposit appearance and adhesion, performance under corrosion conditions and the initial substrate metal weight loss. Adherent platinum coatings up to 8 micrometres thick, with good corrosion resistance, were produced by direct deposition after the titanium substrate had been treated in a solution of sodium fluoride, hydrochloric acid and acetic acid; the optimised conditions being identified in the article. P.E.S.