Electrochemical Characterization of Transition Metal CMP

Jay Jayashankar,[1] Udaya Patri[2] and Earl Johns[3]

[1]Seagate Research, Seagate Technology
1251 Waterfront Place
Pittsburgh, PA 15222-4215

[2]Dept. of Chemical Engineering
Clarkson University
Potsdam, NY 13699

[3]Seagate Research, Seagate Technology
1251 Waterfront Place
Pittsburgh, PA 15222-4215

Binary and ternary alloys of Iron, Cobalt and Nickel are used in the production of the read/write heads in the hard disc manufacturing industry. The increasing miniaturization and complexity of the recording head and the very small head-media spacing requires highly planar, defect free and smooth surfaces; thus development of robust planarization processes for head and media component manufacture is essential.

Little information is available in the literature on the CMP of these binary and ternary alloys. Electrochemical methods along with polishing experiments have been used in understanding metal polishing mechanisms. Hence, in-situ electrochemical characterization of these binary and ternary alloys during CMP would lead to a better understanding of the polishing mechanisms for these systems. As a starting point in this direction, here, we present some of the results from our work on unary systems of Cobalt and Nickel and contrast it with that of Copper. The effect of oxidizers, chelating agents, and corrosion inhibitors in both acidic and basic regimes have been studied through detailed potentiodynamic measurements under static and dynamic (polish) conditions. Experimental results will be presented and discussed against predictions from Pourbaix diagrams.