Effects of corrosion inhibitors in lubricant for Microelectronic lapping processes
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Abstract: Lapping is one of the important processes in microelectronic device fabrication. In hard disk drive production, the functional lubricants are used in the lapping processes to reduce the heat, stress and material debris during the process. However, the lubricant can react with some materials in device structure and causes the corrosion. In this work, selected functional polymers were applied as corrosion inhibitors in glycol-based standard lubricant. The formation of protective polymer films over the surface by their functional groups, were investigated. The corrosion behaviors on antiferromagnetic materials were studied by using the potentiodynamic polarization. The results showed that corrosion rate of antiferromagnetic materials can be reduced by using modified lubricant. Scanning electron micrographs showed the morphology of the polymer film that was formed as the corrosion protective layer on the device surface. Furthermore, the performance parameters from quasi-static test (QST) indicated that the polymer modified lubricants have better corrosion protection and lapping performance statistically than standard lubricant.

Keywords: Corrosion inhibitor; Functional polymers; Lubricants; Lapping processes