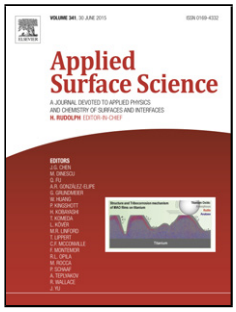

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Germanium Electrochemical Study and Its CMP Application

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Highlights

- The corrosivity for Ge with H_2O_2 is stronger in alkaline media than in acidic one, and it increases with pH.
- Electrochemical study is consistent with CMP experiments.
- NaCl is an activator for Ge corrosion.
- Dodecylamine is an inhibitor for Ge corrosion.
- Slurry in our research has a good polish selectivity to Ge, compared to SiO_2.

Abstract

When the feature size of ultra-large scale integrated(ULSI) circuit shrinks to sub-10nm, germanium(Ge) as a novel material with high hole mobility is needed for further development. Chemical mechanical polishing(CMP) is an important process for the integration of channel materials into silicon wafer. In this paper, starting with electrochemical studies of Ge, different types and concentrations of oxidants for Ge corrosion were investigated; then the effect of NaCl and Dodecylamine for Ge activation and inhibition were studied. After that, corresponding CMP experiments were conducted, which confirmed the results of electrochemical experiments.