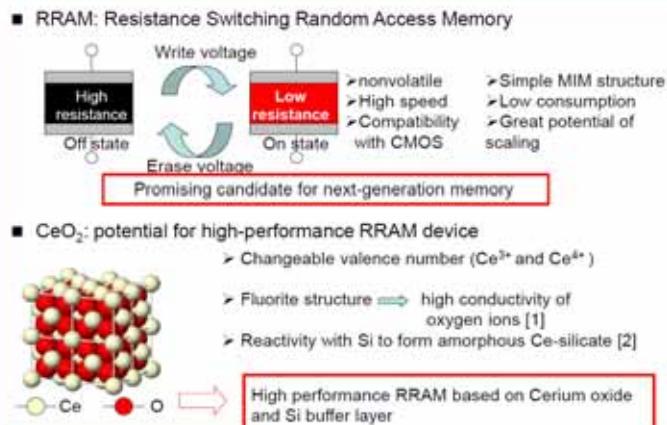




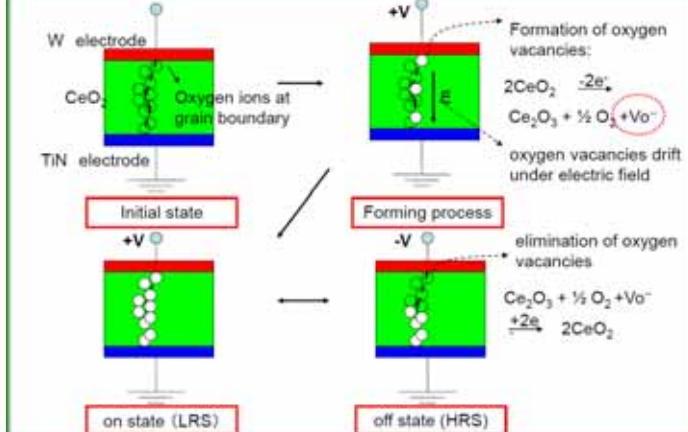
Feasibility study of Ce oxide for resistive RAM application

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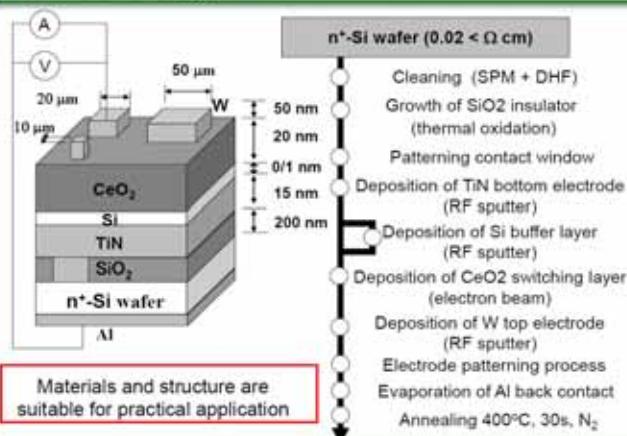
Background and Motivation



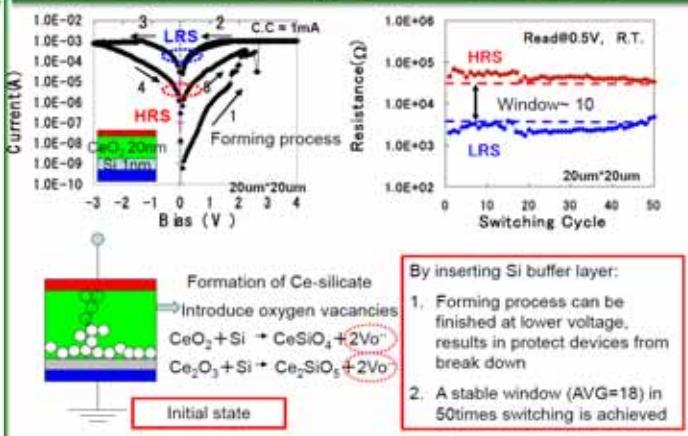
1 Model for switching mechanism



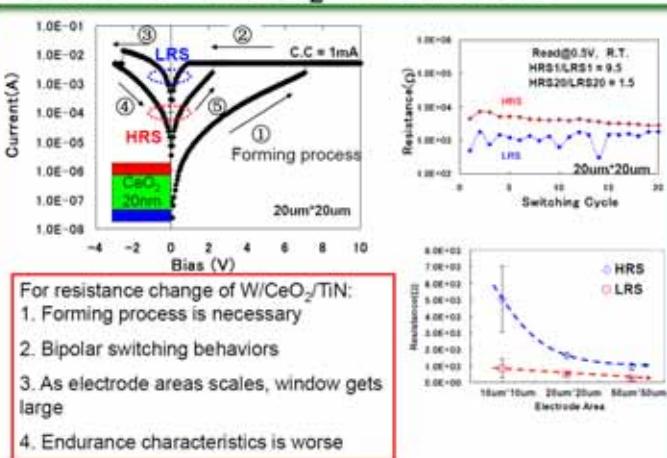
Device design



2 Results of W/CeO₂/Si/TiN structure



Results of W/CeO₂/TiN structure



3 Summary

- W/CeO₂/TiN shows a bipolar resistance switching behavior, large forming voltage is necessary and endurance characteristics is worse.
- Its switching behavior can be explained by the formation and rapture of the filament composed by oxygen vacancies.
- By formation of silicate, Si buffer layer can introduce additional oxygen vacancies into the materials, which helps devices switch under lower voltage, enlarges its window and improves endurance characteristics.

Reference:

- [1] P. Gao et al., Micron, 41, p.301-305(2010)
[2] K. Kakushima et al., VLSI Tech. Dig. p.69-70(2010).