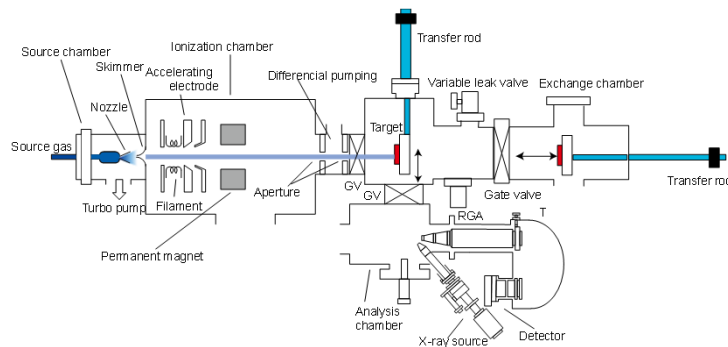


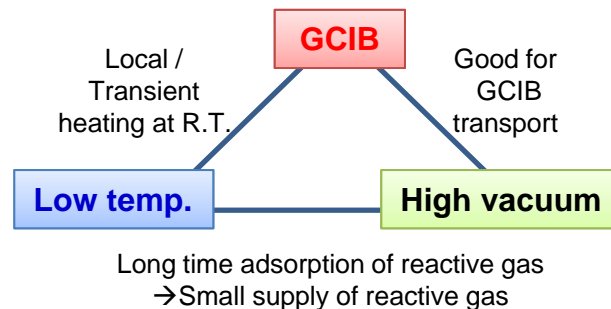
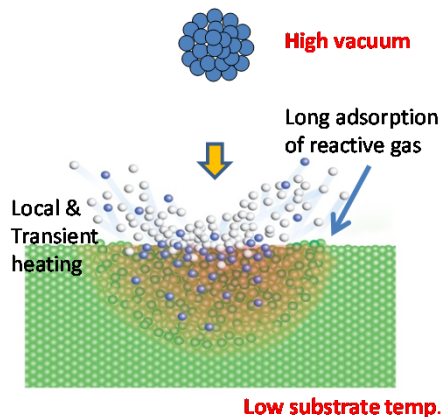
Task Leaders: Noriaki Toyoda (Univ. of Hyogo)
Science area: Nano-manufacturing Science

- Gas cluster ion beam (GCIB) is a directional energetic chemical beam technique, and it enhances chemical reactions owing to dense energy deposition. However, reaction mechanisms are not clearly understood.
- Focus of this task is more fundamental understanding of GCIB reaction mechanisms

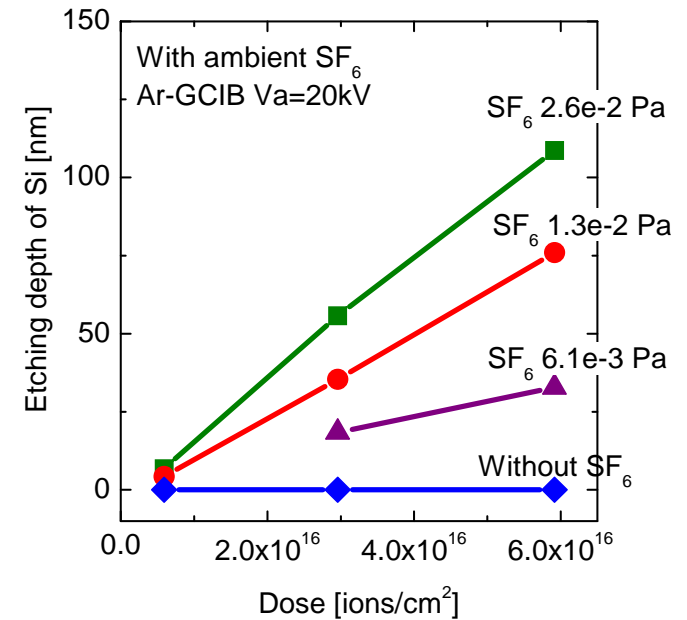
- Energy/atom(molecule) dominates chemical reactions, which suddenly increase above 1eV/molecule.
- Since GCIB enhances chemical reactions owing to its dense energy deposition, reactions between background gas and target are enhanced during GCIB irradiation.
- By intentional introduction of reactive gas as background gas, new etching or film deposition process are expected.



In-situ XPS-GCIB system for surface reaction study



*“GCIB” – “Low temp.” – “High vacuum”
These three issues can co-exist.*



Etching enhancement on Si with Ar-GCIB irradiation with SF₆ background gas.