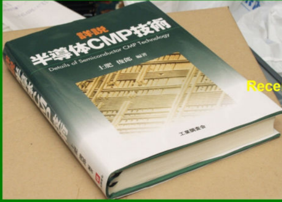
Doi Laboratory's Activities

"Linear Contact Drum Type CMP System" proposed by Prof. Doy

Photos of the experiments (Clean room in Doy Lab.)



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Recent publication
"Details of Semiconductor CMP Technology"
(Kogyo Chosakai Publishing Co.,Ltd.)

ポスト・シリコンデバイスをねらう単結晶SiCのCMP

1) 加工環境を制御したベルジャー式CMP装置 の考案
2) 各種加工物のベルジャー式CMP特性と加工メカニズム
3) 単結晶SiC基板への適用
 ①高圧酸素雰囲気におけるベルジャー式CMP
 ②高圧酸素雰囲気下で光触媒反応を援用したベルジャー型CMP

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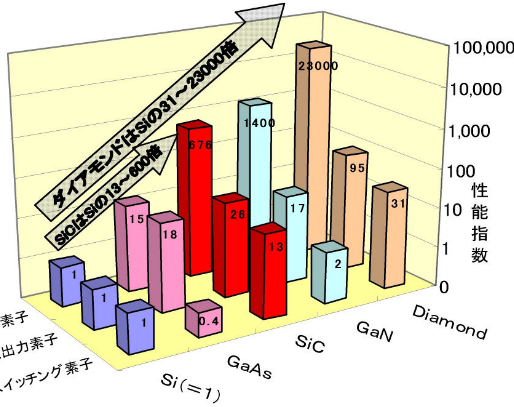
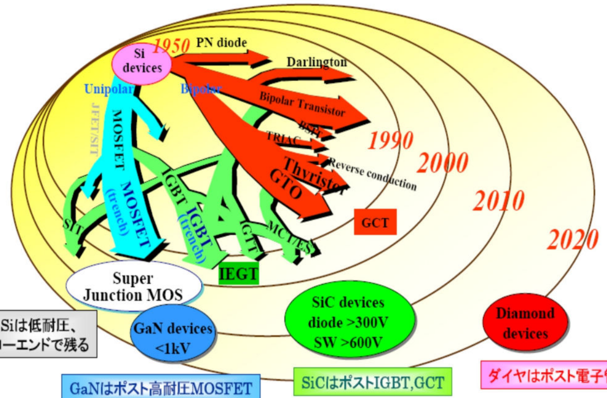


ワイドギャップ半導体デバイスの性能指数の比較

(Siデバイスを1としたとき)

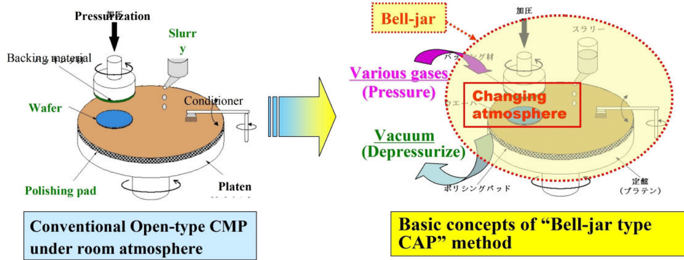
(産総研資料より)

パワーデバイス開発の歴史 （東芝・四戸）



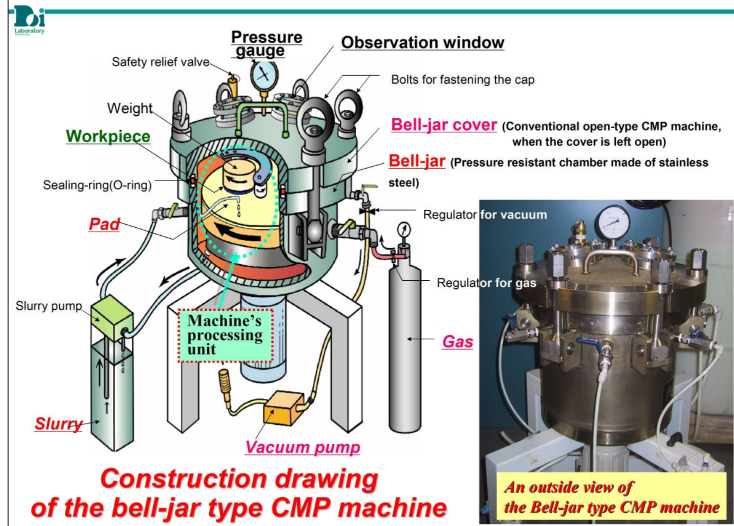
Proposal "A New Bell-Jar Type Controlled Atmosphere Polishing Method & Machine"

★ New CMP machine entirely covered with a bell-jar (Chamber) to control processing atmosphere
 e.g. temperature, humidity, atmosphere, gas and oxygen dissolved in slurry → Effects of gases and atmospheres
★ Study on CMP processing mechanism



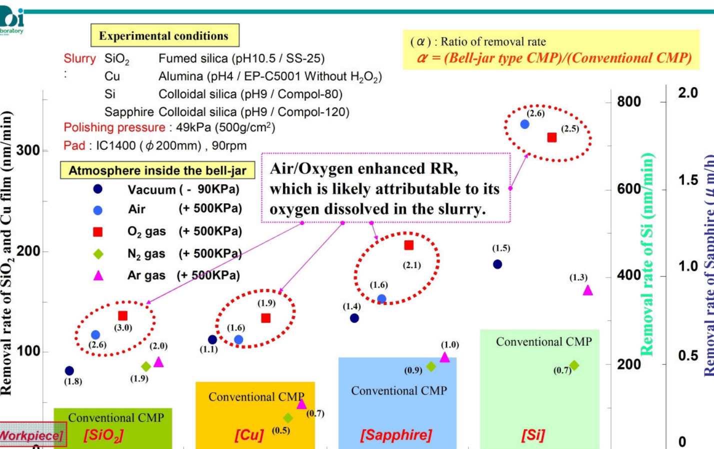
Conventional Open-type CMP under room atmosphere

Basic concepts of "Bell-jar type CAP" method

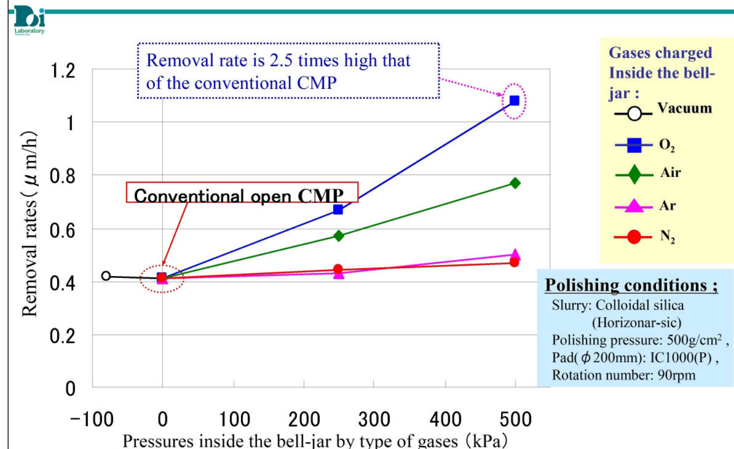


Construction drawing of the bell-jar type CMP machine

An outside view of the Bell-jar type CMP machine



Removal rates of SiO_2, Cu, sapphire and silicon when inside the bell-jar is pressurized at 500kPa with various gases & comparison with the removal rate of the conventional CMP



Relation between the removal rates of SiC single crystal and the pressures inside the bell-jar

Chemically & Mechanically very stable