# Diamond deposition on ion-implanted Si (100) substrate

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Microwave plasma CVD of diamond on Si (100) substrate heavily doped with B and N by ion implantation has been investigated. On the implanted and annealed Si which exhibits a mirror-like surface, the nucleation density of diamond without any other pretreatments can be enhanced about one order of magnitude more than that on Si without implantation under the deposition condition using 600 W, 30 torr and 2% $CH_4$ in $H_2$. Pretreatment of the implanted and annealed Si with KOH for 5 s can significantly raise the nucleation density to be more than $10^8$ $cm^{-2}$, and a continuous diamond film can be obtained after 1 h growth as shown in Fig. 1.

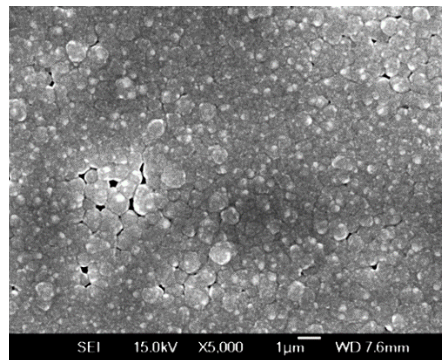


Fig. 1. SEM surface morphology of diamond on the etched Si.