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The Intermediates of Thermal Decomposition of 1,3-Disilabutane to Silicon Carbide on Si(100) Surface

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1,3-Disilabutane (DSB) is an excellent precursor for SiC film growth by CVD, but, the decomposition mechanism is not clear. In this study, DSB was exposed on Si(100) surface under 100 K in the UHV chamber and thermally decomposed up to 1300 K. Adsorbed and desorbed species detected by Reactive Ion Scattering (RIS), AES, and TDS in the decomposition. Using RIS method, physisorbed DSB was detected under 100 K. As the surface temperature increased, physisorbed DSB partially decomposed to C_2SiH_4 and the rest desorbed in the temperature range 120 K - 150 K. Above 150 K to 900 K, only the second intermediate, $CSiH_4$ existed on the surface. TDS and AES results showed $CSiH_4$ lost hydrogens and became the SiC above 900K.