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【252】Mechanisms for direct wafer bonding of CVD dielectrics

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The need for 3D integration in semiconductor industry has driven the key technology of wafer bonding to a new level. Low temperature plasma activated wafer bonding (LT-PAWB) requires high adhesive forces between two polished surfaces at reduced annealing temperatures. In this process silicon wafers with a deposited dielectric layer (SiO2, SiCxNy) are activated, contacted and annealed. The plasma condition as well as the dielectric's composition have a significant impact on the final bonding properties. TEM-EDX, AR-XPS, AES and SE are applied on single activated surfaces and bonded samples in order to derive a model of the physical mechanisms occurring during the bonding process.

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