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Identification of the major cause of endemically poor mobilities in SiC/SiO_2 structures[1] XIAO SHEN, SOKRATES T. PANTELIDES, Vanderbilt University — Mobility degradation at semiconductor-dielectric interfaces is generally attributed to defects at the interface or inside the dielectric, as is the case in Si/SiO_2 structures. In the case of SiC/SiO_2 structures, a decade of research focused on reducing or passivating interface and oxide defects, but low mobilities have persisted. It is known that during oxidation of Si, Si atoms are emitted into the substrate, but they do not form strongly-bonded complexes and their effects are usually benign. In contrast, during oxidation of SiC, C atoms are emitted into the substrate and they can form strongly-bonded carbon complexes. Here we identify one particular complex that explains a range of experimental defect signatures and electrical measurements. We propose that this complex is a major cause of the poor mobility in SiC/SiO_2 structures.

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