Double D-centers related donor-acceptor-pairs emission in fluorescent silicon carbide -
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Double D-centers related donor-acceptor-pairs emission in fluorescent silicon carbide
A new boron-induced deeper acceptor level (퐷∗-center) different from the D-center in nitrogen-boron co-doped 6H
fluorescent silicon carbide (f-SiC) is revealed by measuring the temperature-dependent photoluminescence (PL). The 퐷∗-
center is correlated to the dominate donor-acceptor-pair (DAP) recombination at low temperature ranges in f-SiC with a PL
peak around 1.90 eV. A hole-trap with an energy level that lies between the 퐷∗-center and the D-center is predicted to
exist in the f-SiC samples. A two-step thermal ionization involving the hole-trap is proposed to explain the evolution of both
퐷∗-center and D-center related temperature-dependent DAP recombination.

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