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【651】 Structure-Property Relations in the $\text{Ca}_{1-x}\text{Sr}_x\text{AlSi}$ Solid Solution

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CaAlSi and SrAlSi are ternary superconductors that crystallize in AlB_2 -type structures with critical temperatures of $T_c = 8$ K, and 5 K, respectively. They surprisingly differ in properties among each other although they have similar electronic structures, and only a small difference in their crystallographic structures. We have in a systematic approach analyzed the $\text{Ca}_{1-x}\text{Sr}_x\text{AlSi}$ solid solution and its evolution of the electronic and structural properties. We find that the superconductivity in this system is closely connected to the appearance of the structural distortion of the $[\text{AlSi}]_{62}$ - layers. Based on our results we establish the electronic phase diagram and compare it to the one of MgB_2 .

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