

CdO掺杂对BaTiO₃基半导化陶瓷PTCR效应的改善

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摘要 钛酸钡半导化陶瓷中的PTCR效应通常与材料中的施受主掺杂密切相关,蒸汽掺杂能够大幅度影响材料的PTCR效应。CdO在高温下具有较高的蒸汽压,是一种适用的蒸汽掺杂剂,研究了CdO以及CdO蒸汽对掺Y³⁺的Ba_{1-x}Sr_xTiO₃陶瓷的PTCR效应的影响,结果首次发现了Cd²⁺掺杂样品的PTCR效应都有不同程度的提高,采用蒸汽掺杂时,效果更为显著。现有的理论很难解释Cd²⁺掺杂能够提高钛酸钡基材料PTCR效应。我们从缺陷化学的角度,分析了Cd²⁺在BaTiO₃基材料中的行为,推断表明这种现象可能是由于铁电相变时,处于晶界区的Cd²⁺在Ba位和Ti位之间转换造成的。

关键词 [氧化镉](#) [掺杂](#) [钛酸钡](#) [陶瓷](#) [正温度系数](#) [热敏电阻器](#)

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Improvement in PTCR effect of BaTiO₃-based semiconducting ceramics caused by CdO dopant

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Abstract The PTCR (positive temperature coefficient resistivity) effect of BaTiO₃ based semiconducting ceramics is usually to the donor or acceptor dopants. It would be influenced severely by vapor dopants during sintering. With high vapor pressure at high temperature, CdO could be employed as a suitable vapor dopant. The influence of CdO and CdO vapor on the PTCR effect of BaTiO₃ based semiconducting ceramics was studied. It was found for the first time that either solid CdO or CdO vapor dopant could enhance the PTCR effect of BaTiO₃ based semiconducting ceramics. The enhancement caused by CdO vapor dopant was much more obvious than the caused by solid CdO dopant. This phenomenon could not be interpreted by the existing theory. From a view of defect chemistry, it was presumed that the enhancement effect were due to the transversion of the Cd²⁺ at grainboundary from Ba sites to Ti sites during ferroelectric phase transition.

Key words [CADMIUM OXIDE](#) [DOPE](#) [CERAMICS](#) [POSITIVE TEMPERATURE COEFFICIENT](#) [THERMISTOR](#)

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