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显微组织对Cu-Cr-Ni合金高温氧化行为的影响

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摘要: 研究了两种单/双相Cu-Cr-Ni合金的高温氧化行为。结果表明,合金氧化动力学偏离抛物线规律,其瞬时抛物线速率常数随时间延长而降低。两种合金表面氧化膜的结构差别较大,单相合金表面形成一连续的Cr₂O₃层,双相合金表面氧化膜外层是一连续的CuO层,Ni和Cr的氧化发生在合金内部。这种合金与氧化物共存的混合内氧化与经典的内氧化明显不同,氧化层最里面形成了一连续的Cr₂O₃膜,抑制了合金的进一步氧化。

关键字: Cu-Ni-Cr合金; 单/双相组织; 高温氧化

Effect of microstructure on high-temperature oxidation of Cu-Cr-Ni alloys

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Abstract: The high temperature oxidation behavior of both single/double-phase Cu-Cr-Ni alloys was studied. The kinetics for oxidation of both alloys are particularly irregular and deviate from the parabolic rate law and their instantaneous rates decrease with time in creasing. Oxide scale structures for both alloys are completely different, single-phase alloy forms a

continuous Cr_2O_3 outer layer, while double-phase alloy produces a CuO outer layer, nickel and chromium are mainly oxidized inside the alloy, the microstructure of the internal oxidation region containing a mixture of alloy and oxide phases does not correspond to a classical internal oxidation. The further oxidation is restrained because there is a nearly continuous Cr_2O_3 layer inside the alloy.

Key words: Cu-Cr-Ni alloy; single/double phase morphology; high temperature oxidation

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