基于RBF-AG算法的7050铝合金电磁半连铸参数优化

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摘　　要：为解决7050铝合金大尺寸扁锭成型裂纹倾向大、工艺参数不易找准的问题，建立基于RBF的电磁半连续铸造神经网络模型，并采用遗传算法对7050铝合金电磁半连续铸造过程的工艺参数进行了优化计算。结果表明，当7050铝合金的成分(质量分数)为Zn 6.1%、Mg 2.3%、Cu 2.2%和Zr 0.14%时，电磁半连铸工艺参数的优化值为：铸造速度52 mm/min、铸造温度724 ℃、扁锭宽面冷却强度134 L/min、扁锭窄面冷却强度22 L/min、电磁强度11749 A·turn、电磁频率27 Hz。在优化后的工艺参数条件下，无裂纹铸锭成品率比优化前的成品率提高20%。

关键字：RBF神经网络；遗传算法；参数优化；电磁半连续铸造

Parameter optimization for semi-continuously casting of 7050 Al alloy under low frequency electromagnetic based on RBF-AG algorithm

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Abstract: To solve 7050 Al alloy ingot large crack tendency, a parameter optimization model was developed. The optimization model was based on RBF artificial neural network, the technics parameter was optimized by genetic algorithm. The simulation results show that when the 7050 alloy chemical composition(mass fraction) is Zn 6.1%, Mg 2.3%, Cu 2.2% and Zr 0.14%, the optimizing value of cast velocity is 52 mm/min, the cast temperature is 724 ℃, the broarside cooling intensity is 134 L/min, the narrow-side cooling intensity is 22 L/min, the electromagnetic intensity is 11 749 AZ, the electromagnetic frequency is 27 Hz. Compared with the product without parameters optimized, the product rate is increased by 20%.

Key words: RBF artificial neural network; genetic algorithm; parameter optimization; semi-continuously electromagnetic

casting