矿冶科学与工程新进展

——庆祝北京矿冶研究总院建院40周年论文集

下册

北京矿冶研究总院建院40周年论文集编辑委员会　编

BGRIMM

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冶金工艺与设备

建院以来冶金科研成果回顾

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摘 要 对建院40年来有色金属提取冶金领域所取得的科研成果进行了评述。

关键词 提取冶金 科研成果

REVIEW ON THE RESEARCH ACHIEVEMENTS OF EXTRACTIVE METALLURGY IN BGRIMM

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ABSTRACT Scientific research achievements on extractive metallurgy in past 40 years is reviewed.

KEYWORDS Extractive metallurgy Research achievement

建院40年来,我院在有色冶金领域完成了500多项科研课题,取得200多项重大成果。在所承担的课题中,有国家重点攻关项目,省部级重点项目,企业委托项目,国际合作项目,还有自行开发的项目。课题涉及的范筹包括基础理论研究、应用技术研究、工程设计、加工制造以及产品开发。在所完成的项目中,有约100项获省部级以上各种奖励,其中国家科技进步特等奖1项,一等奖3项,二等奖2项,国家发明二等奖1项。此外,获国家专利6项。这些成果的应用,对强化冶炼过程、提高生产效率、改进产品质量、节省能源、降低消耗、加强环境保护、改善劳动条件、充分利用资源等有着重大现实作用和深远的指导意义。

下面就铜、镍钴、铅锌、锡锑及贵金属的冶炼、二次金属回收、矿产资源综合利用、冶金节能、冶金设备和产品开发等几个方面进行简单论述。

1 铜冶金

1.1 白银炼铜法

白银公司冶炼厂原采用反射炉熔炼铜精矿,工艺设备落后,效益不好。为强化冶炼过程和改善硫的回收,1973年我院向冶金部提出采用液态鼓风熔炼铜精矿的建议,液态鼓风是熔池熔炼的一种,是与国外诺兰达法、沃克拉法、瓦纽科夫法相似的强化熔炼方式,其实质是通过风眼向熔体中鼓入空气(或氧气),使熔体受到激烈搅动,从而加速传质和传热过程。1974年冶金部组织有关单位在白银冶炼厂进行攻关,1977年完成日处理铜精矿100t的工业试验。结果表明,新的液态鼓风熔炼工艺与原反射炉工艺相比,床能率提高1倍,烟气SO_2浓度提高3倍。该成果1981年获国家发明二等奖,并被称之为白银炼铜法。其后,通过不断的技术改造,又实现了富氧熔炼作业,使处理能力显著提高,当富氧浓度达40%时,床能率