

Chip Removal Regularity and Bit Face Shape Selection in Impregnated Diamond Bit Drilling

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Abstract

On the basis of relevant information and experimental results, and by using the Newtonian fluid planar model in fluid mechanism and the flow quantity and pressure loss formulae for a fluid passing through a slot, the flow pattern (a vortex flow pattern) of the flushing fluid between the bit face and hole bottom rock has been obtained. The author has designed several impregnated diamond bits of different face shape (they are of master-slave waterway type, propeller type, central cooling type and spiral waterway type in which the waterway of vortex flow are shortened greatly). From theoretical analysis, such bits have characteristics of slow temperature rise for bit face and low final balance temperature, which are the theoretical basis for bit design. Lastly, the article indicates that in practical drilling it is necessary to design or select a bit suitable to the rock drilled and operate with reasonable parameters (pressure ratio, linear speed, flow quantity and pump pressure) in order to ensure the flush fluid with sufficient hydraulic horse power flowing through the bit face. In such cases, optimal wearability for the bit and optimal drilling efficiency may be obtained.

新书介绍:《国外主要有色金属矿产》

《国外主要有色金属矿产》一书,是在广泛搜集、筛选、核实和分析研究文献资料的基础上编写而成的。

该书汇集了国外铝、铜、铅、锌、镍、钨、锡、钼、铋、汞和金共11种有色金属矿产资源的分布 主要矿床类型、储产量、供求和保证程度等资料,并分析了它们的发展概势。书中表列了1807个矿产地的矿床类型、地质特征、成矿时代、储量品位和采选规模。在地质背景图上,将全部矿产地按矿种、分类型分别编制了11幅世界矿床(区)分布图。

书中将有色金属矿产资源划分为10个主要地质—工业类型,4个大成矿时代,16个主要成矿区(带);将国外11种有色金属矿产地分矿种划分为56个主要集中区。按资源储量的多寡,将国家划为5种类型,按供求关系划出3种类型。

书中对近二三十年来国外有色金属矿产经济变化趋势做了分析。指出:(1)国外多数矿产资源的储量增长较多,而品位逐渐下降;(2)矿产品的产量和消费量增

长较快,但增长率明显放慢;(3)发展中国家多数矿产储、产、消费量在世界上所占的份额有所增长,显示出有色金属矿产初级商品的生产、消费格局发生了变化;

(4)有色金属的真实价格(不变价格)六七十年代是上涨时期,80年代以来多数有下降势头;(5)就世界范围来讲,有色金属矿产资源可保证本世纪末及以后若干年的需求。

该书是由中国有色金属工业总公司北京矿产地质研究所主编,参加单位有中南工业大学地质系、昆明工学院地质系和吉林矿产地质研究所。全书约85万字,16开本。由冶金工业出版社出版,预计今年第四季度出书,新华书店发行,也可与主编单位(安外北苑)联系。

《国外主要有色金属矿产》一书的主要特点是:内容新颖丰富、资料系统翔实、图文并茂、实用性强。以此宏篇论述国外有色金属矿产资源及其经济状况的专著,目前国内尚属少见。该书对有关专业的教学、科研、生产和管理工作都很有参考价值。