基于SRTM的重砂矿化信息提取方法——以中甸地区为例

引用本文：曹殿华,王安建,管烨,王高尚.2008.基于SRTM的重砂矿化信息提取方法——以中甸地区为例[J].地球学报,29(1):121-126.

DOI：10.3975/cagsb.2008.01.16

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基金项目:国家科技攻关计划课题(编号:2001BA609A-05,2003BA612A-05); 国家973课题(编号:2002CB412607); 国家科技支撑计划课题(编号:2006BAB01A07,2006BAB01B05)

中文摘要:本文对可覆盖我国全境的3 arc.s(～90 m)SRTM数据进行重砂矿化信息提取方面应用前景分析,解释了SRTM数据来源、精度、数据类型及预处理方法,认为SRTM3数据的可以初步满足1:5万～1:100万尺度成矿预测的需要.在GIS中进行了中甸地区汇水盆地的自动提取,结果与基于地形图人工绘制的基本相同,大大提高了工作效率.在GIS中以汇水盆地为进行重砂矿物异常的取值,对于中甸地区斑岩型铜矿床的找矿预测,包含成矿元素及伴生元素Cu、Au、Ag、Pb、Zn的重砂矿物对找矿具有直接的指示意义,各矿物分类中各种矿物的越复杂、含量越高,其指示矿化存在的意义越大,以此可做为异常综合评价的准则.在GIS中基于该预测评价准则采用模糊逻辑模型进行了异常的综合,完成了模糊成员权重赋值和重砂矿示矿综合模糊推理网络构建,计算得到的汇水盆地重砂综合异常图很好地反应了已知矿区的分布,并提供了较多的新异常区,为与其他学科关联的综合分析和野外检查提供了方便.因为岩型铜矿品位相对高、富矿多、矿物组合相对复杂,且红山矿床剥蚀程度相对较高,因此模糊示矿概率高.该区要寻找斑岩型铜矿,具有中级模糊示矿概率(0.5～0.8)的汇水盆地异常要重视.经野外检查,发现普上和地苏嘎两处斑岩型铜矿的矿化新区.

中文关键词:SRTM 重砂 GIS 模糊逻辑 中甸地区

The Extraction of Mineralization Anomalies from Heavy Placer Mineral Data Based on SRTM: Case Study of the Zhongdian Area

Abstract:The 3 arc seconds SRTM data,i.e.,the DEM data covering whole China,are useful to the prognosis of mineral resources.This paper deals with the acquisition means,accuracy,data type and preprocessing technique.The accuracy of SRTM can satisfy the requirement of metallogenic prognosis on the scales from 1:50,000 to 1:1,000,000.Based on the D8 algorithm,the catchments in Zhongdian area can be extracted in GIS,and the result is similar to that obtained from the drawn geographical map numeralization of the heavy placer mineral map was carried out for each catchment.As for the prognosis of porphyry copper deposits in Zhongdian area,the heavy placer minerals which contain such elements as Cu,Au,Ag,Pb and Zn can show mineralization directly.The more complex the mineral assemblage and the higher the content,the m probable the existence of mineralization,and this can be used as the criterion of data integration.According to the criterion,the fuzzy logic membership value was given and th fuzzy inference network was designed on GIS software.The calculation results are in accord with the distribution of the known deposits and show some new significant catchments.Differing from the Hongshan skarn copper deposit,the Pulang and Xuejiping porphyry copper deposits are situated in intermediate fuzzy logic probability(0.5～0.8),which might be controlled by grade,mineral assemblage,and denudation.The catchments with intermediate fuzzy logic probability(0.5～0.8)are important to search for