

论文

基于GIS-BN技术的范各庄矿煤12底板突水态势评价

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摘要:

为了评价陷落柱型煤矿突水危险性,设计实施了基于GIS-BN技术的煤矿陷落柱型突水危险性评价方法,并在范各庄矿实际应用。在深入分析范各庄矿突水因素的基础上,应用K-Means算法确定并离散化了突水因素的数据,应用ARCGIS和BN结合的方法建立了针对12煤层底板突水危险性评价模型,通过BN参数学习和BN突水推理,对突水危险区域进行了区划,并对模型的模拟效果进行了分析。结果表明:突水危险区域位于矿区的西北部和东南部。西北部的高危区域属于典型的陷落柱突水区,高危区域基本上和西北部的陷落柱异常发育地带吻合;西北部广泛分布的塌陷坑在一定程度上加重了该区潜在突水的可能性;东南部危险地带,属于典型的断层突水地带,集中在F5-F8和F4-F10-F11-F12两大断层带周边地区。以上区域的突水可能性非常大,在开采时需要采取适当措施防止突水发生。评价结果的拟合率高达80%,说明GIS-BN方法对煤矿陷落柱型突水危险性评价是可行和准确的。

关键词: 突水危险性 GIS-BN 范各庄煤矿 突水推理

Water inrush assessment of coal 12 floor using a GIS based bayesian network for Fangezhuang Coal Mine with collapse column

Abstract:

In order to evaluate the risk of coal mine water inrush of the collapse column,taking Fangezhuang coal mine for example,on the basis of depth analysis of Fangezhuang coal mine water inrush factors,the K Means algorithm was used to identify and discrete the data of water inrush factors.The combination of ARCGIS and BN was used to establish water inrush risk assessment model of 12 coal floor.By learning of the parameters and reasoning of water inrush in BN,hazardous areas of water inrush was conducted division,and the effects of the model was analyzed.As it turned out,hazardous areas of water inrush are located in the southeast and northwest.The northwest part belongs to typical water inrush areas of collapse column,and the highest risk areas are basically consistent with abnormal development zone of collapse column in the northwest;to a certain extent,widely distributed collapse pits in the northwest increase potential possibility of water inrush.The southeast dangerous area,typical water inrush area of fault,concentrated in surrounding areas of two major fault lines between F5-F8 and F4-F10-F11-F12.With large possibility of water inrush above areas,it should take some appropriate measures to prevent water inrush.The fitting efficiency of evaluation can reach 80%.So using the method of GIS-BN is feasible and accurate to evaluate water inrush risk in coal mine.

Keywords: water inrush risk;GIS BN;Fangezhuang Coal Mine;reasoning of water inrush

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