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灾害地质

抽水作用下先期断裂对地裂缝的影响研究

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摘要:

过度抽取地下水和先期存在的断裂构造是西安市地裂缝地质灾害发生的主要原因。作者首先从理论上分析了抽水情况下地裂缝形成的张拉破裂机制、剪切破裂机制和张剪复合破裂机制,并从结构面控制理论分析了先期断裂在地裂缝形成中的控制作用; 然后依据比奥三维固结理论,采用FLAC软件建立了西安地裂缝的计算模型,比较了抽水作用时没有先期断裂和地层差异、有先期断裂而没有地层差异、有地层差异而无先期断裂等情况时的地面变形特征,得出抽水作用下,先期断裂对地裂缝的形成及发展具有诱导、隔离和放大的耦合作用,从而得出先期断裂不仅仅只是地裂缝形成的构造基础的结论。

关键词: 抽水 地裂缝 耦合作用 数值模拟

INFLUENCE OF PRELIMINARY FAULT ON GROUND FISSURES DURING PUMPING ACTION

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Abstract:

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Ground-water depletion and preliminary fault are the main factors arousing the ground fissures hazard in Xi'an City.Firstly,the tensile crack machanisim,shear crack machanisim,shear and tensile multiple machanisim of the ground fissure are analysis in theory,and the controling role of the preliminary fault on the causes of ground fissure is analysed based on structrual plane controling theory; Then,authors set up a numerical simulation model with three dimension biot consolidation theory,through this model,the displacement of three cases,pumping without preliminary fault,pumping with preliminary fault,pumping without preliminary fault but with stratum diffrence,are compared,the authors found that the preliminary fault is not only the tectonic foundation,but also has induction,amplification and segregation fuction on the formation and development of the ground fissues.

Keywords: Pumping Ground fissures Coupling Numerical simulation

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