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论文

粉煤灰掺量对土壤混合材料空气阻隔性影响的试验

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摘要:

治理自燃煤矸石山需要覆盖大量惰性材料, 为节约土源、废物利用和保障环境效益, 研究粉煤灰代替部分土壤做自燃煤矸石山覆盖材料的最佳配比。将粉煤灰分别与粉土、粉质黏土按照不同体积比均匀混合, 通过室内模拟实验, 测定不同配比混合材料的空气阻隔效果, 分析不同粉煤灰掺量对混合材料空气阻隔性的影响规律。结果表明: 在粉质黏土、粉土中掺入粉煤灰, 混合材料的空气阻隔性随粉煤灰掺量增加而衰减, 不同压差下测定其渗透率与粉煤灰掺量呈近似的指数函数关系; 粉煤灰含量50%和30%分别是决定粉土、粉质黏土空气阻隔性变化的一个重要特征。建议在粉土中掺入粉煤灰的比例小于50%, 在粉质黏土中掺入粉煤灰的比例小于30%。

关键词: 粉煤灰; 混合材料; 空气阻隔性; 自燃煤矸石山; 渗透率

Experiment on the influence of fly-ash to the air isolation effectiveness of soil mixture

Abstract:

Treatment of coal gangue piles with spontaneous combustion has a heavy demand to inert materials.To reach the aims: saving soil, utilization of waste and ensuring environmental benefits, the study on the optimum volume ratio of fly ash to replace partial soil as covering materials for coal gangue piles with spontaneous combustion is purposeful.Fly ash was mixed evenly with silt, silt clay according to different volume ratio.Through the indoor simulation experiment, air isolation effectiveness of different ratio mixed materials of soil and fly-ash was tested, and the influence of fly-ash with different volume to the air barrier property of hybrid materials was analyzed.The results show that, when mixed fly-ash in silt-clay and silt, the air barrier property of mixed materials decreases steadily with the increasing of fly-ash, and approximate expressions respectively shows as an exponential function between permeability and fly-ash content at various pressure differentials.Ash content of 50% and 30%, respectively, determines the isolation changes, which is an important characteristics.It suggests that fly ash content is less than 50% and 30% respectively in silty-soil and in silt-clay.

Keywords: fly-ash; mixed material; air isolation effectiveness; coal gangue piles with spontaneous combustion; permeability

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