



Application of Paste Backfill in Underground Coal Fires

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Coal fires are known from different coalfields worldwide. China, India, USA, Australia, Indonesia and South Africa are the main countries affected by coal fires. The fires are thermally intensive and cause numerous sinkholes, large-scale subsidence, air pollution, global warming, loss of mining productivity and increasing safety risk. The Wuda Inner Mongolia coalfield has been selected as a possible test area for paste backfill. The traditional methods, executed by fire fighting teams, by covering the coalfire areas with soil, blasting burning coal outcrops and injecting water in the subsurface fire pockets are continuously improved and extended. Initiatives to introduce modern techniques, such as backfill placement at fracture and borehole, to cool down the burning coal and cut off the air supply. This study is to investigate backfill materials and techniques suited for underground coal fires. Laboratory tests were carried out on physical, chemical and mechanical properties of different backfill materials and mixtures thereof. Special attention was paid to materials generated as by-products and other cheaply available materials e.g. fly ash from power plants. There is a good chance that one of the different material mixtures investigated can be used as a technically and economically viable backfill for underground coal fires.