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SPONTANEOUS COMBUSTION RISK ANALYSIS IN SUBSURFACE ENVIRONMENTS: CARBON MONOXIDE DATA PROCESSING TOOL

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Abstract

Early detection of spontaneous combustion processes through dedicated tools aimed at processing significant measurement data, can provide major improvement of safety levels in underground working environments. As an index of self-heating event occurrence, the increase in carbon monoxide content in hard coal collieries atmosphere became significant since the early stages of this severe phenomenon. To highlight the changes in carbon monoxide average levels, this paper synthesizes the results of research directed towards embodiment of two new mathematical data processing tools targeted on fluctuation decrement (exponential adjustment) and assessment of potential evolution trend (cumulative sum). The results of the present research represent a compulsory phase in conceiving an expert system for automated fire index gasses monitoring and developing a complex, multi-parametrical method for assessing spontaneous combustion occurrence risk in subsurface environments.

Keywords: cumulative sum, environment, exponential adjustment, risk, spontaneous combustion, subsurface

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