Prospect of CBM exploration & Development in Shilou Area in Eastern Fringe of Ordos Basin

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Abstract: Based on the current large quantity of information the authors have made a systematic investigation of the sedimentary characteristics and gas-bearing capacity of coal seams of Carboniferous and Permian Systems in Shilou area in the eastern fringe of Ordos Basin, and consider that there exists material foundation for formation of coalbed methan and geological conditions for occurrence of CBM. Focusing on factors that influence gas-bearing capacity of coal seams, the authors describe in details the gas-bearing characteristics of coal seams. The major geological factors that lead to great variation of gas content of coal seams are: degree of
metamorphism in evolution of coal, the effective thickness and capping conditions of the overlying strata. Based on the characteristics of coal reservoir and geological conditions for occurrence of CBM, the prospects of CBM exploration and development can be divided into two categories, namely, the favorable and fairly favorable zones.

**Keywords:** Shilou area in easter fringe of Ordos Basin; CBM; exploration and development; prospect

**Analysis on CBM Occurrence Characteristics and Influencing Factors in Xuandong Coal Mine of Xuanhua Coalfield**

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**Abstract:** Based on coalfield prospecting data and data from active coal mines, the paper analyzes the CBM occurrence characteristics and influencing factors in Xuandong coal mine of Xuanhua coalfield. Evaluations on the current condition concerning CBM exploration and development and utilization are also made, and suggestions are given. The paper brings forward the targets and requirement that evaluations of CBM resources and its development potential should follow.

**Keywords:** CBM; occurrence conditions; influencing factors; Xuandong Mine

**Prospect of Exploration of CBM Resources in Fukang Mine Area in Xinjiang and Recommendations on its Development**

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**Abstract:** Based on the study of tectonic structures, coal seams, the characteristics of petro-graphic and coal reservoir and the geological factors that influence CBM occurrence rules in Fukang coal mining area, the authors describe the favorable and unfavorable factors for development of coalbed methane. Currently, the most favorable development block is Dahuangshan-Baiyang River section. The ranks of coal are mainly long-flame coal and gas coal in the mine area. There are a multiple of thick coal seams. The gas content and gas saturation is high. The permeability is relatively high. There is a good prospect for resources exploration. The authors put forward that the integrated development model for coal mining and gas extraction is suitable for the actual conditions of the coal mine area.

**Keywords:** Coalbed methane; rules of occurrence; development; exploration; Fukang mine area

**Microscopic mechanism study on the influence of coal rank on adsorption capacity**

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**Abstract:** The interactions of CH₄ with one benzene ring and one benzene ring added by carboxyl,
aldehyde, hydroxide, methyl and methylene have been studied by the quantum chemistry MP2 method. By the calculation, the results show that the oxygen-containing functional groups can reduce the adsorption, consequently reduce the adsorption capacity, but the pendant chains is opposite. Utilizing the knowledge of coal structure chemistry, coal adsorption theory and the calculation results, the varieties of the Langmuir volume with coal rank are analyzed, and the experiment phenomenon of coal adsorption capacity with coal rank are explained in this paper.  
Keywords: Coal rank; methane; adsorption; quantum chemistry

**Analysis on Influencing Factors of the Determination Period of Coal Methane Content**

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**Abstract:** The natural desorption method is usually adopted for the coalbed methane content determination. It is generally thought that the determination result of the method is of relatively high accuracy, but the fact of having long determining period indicates the method is hard to meet the demand for coal and CBM exploration. The factors influencing the determination period include the coal seam properties such as coal body texture, coal rank, coal lithotype and quality, and the testing method such as test conditions, operation and relevant technical rules, etc. Taken Jincheng as an example, the main influence factors existing in testing method like temperature, observing frequency, termination limit for desorbing, etc. are analyzed in this paper. Furthermore, the corresponding adjustment and improvement measures are also made, and a kind of new method of rapid determination of CBM content is briefly introduced.  
**Keywords:** Coalbed methane; content determination; influence factor; rapid determination

**Prediction of Coal and Gas Outburst Based on Neural Network and Grey Theory**

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**Abstract:** The key to predict coal and gas outburst affected by many factors by neural network is to choose parameters. It is unreasonable and unscientific in some extend to choose parameters either by experience or follow the principle so-called ‘the more the better’. The authors filtrate parameters by grey relevance analysis and combine neural network model to predict. Qualitative analysis is transformed into quantitative analysis is terms of the choice of parameters. The actual example demonstration that this method is feasible.  
**Keywords:** Coal and gas outburst; prediction; grey relevancy analysis; neural network

**Discussion of Surface Horizontal Wells for Coal and Coalbed Methane Co-production in Fuxin Wulong Coal Mine**
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Abstract: There are three methods to deal with coal mine methane, including extraction before coal production, extraction while coal production and gob well pumping. According to the practical situation of Fuxin Wulong coal mine, this paper introduces the project which contains pre-extraction, extraction while production and gob well pumping. The project is composed of geology background, horizontal well design, surface processing (extraction, CNG), effect evaluation, etc.

Key words: Co-production, pre-extraction, extraction while mining, gob well drainage, surface processing

Application of Non-metallic Pipes in Coalbed Methane Fields Project

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Abstract: The construction of coalbed methane fields is launched with the development of coalbed methane resources in China. Polyethylene (PE) pipes and flexible composite pipe are going to be applied in coalbed methane pipeline network because of the economics, causticness and security.

Keywords: Coalbed methane; Polyethylene (PE) pipes; flexible composite pipe; causticness

Research on the Orthogonal Experiment for CBM Drilling Fluid Formulation

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Abstract: In cognizance of the requirement of the drilling fluid using for 11# coal seam in Hancheng area whose permeability is low, this paper employed orthogonal experiment to design the formulation of drilling fluid. Performance test for the formula of the orthogonal experiment is conducted, and the optimum dosage of the drilling fluid is gain. The density, viscosity, shearing force, pH of the drilling fluid is substantially in line with the requirement of horizontal drilling based on the formula analyzed by the orthogonal experiment. This drilling fluid not only could protect the wall of the borehole, but also could reduce the damage to the permeability of the coal seam caused by the drilling technology.

Keywords: Drilling fluid; performance; orthogonal experiment

Tri-generation for Energy Conservation and Reduced Emission in Coal Mines
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Abstract: The use of gas for power generation and refrigeration of the residual heat resulted from power generation for lowering underground temperature in deep coal mines for effective utilization of gas is a new technology. The paper describes briefly the significance and research on related technology for tri-generation.

Keywords: Coal mine methane; tri-generation; underground thermal pollution

Status Quo and Prospect of CBM Utilization at Home and Abroad and Prospective

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Abstract: Coalbed methane (CBM) has been taken as a harmful gas which would jeopardize coal mine safety, however, due to the recent energy crisis, people gradually change their mines. As a kind of effective and clean energy, CBM may bring us tremendous economic and environmental benefits. China is rich in CBM resources and has broad application prospective, but CBM industry in China started fairly late and still fall behind those developed countries in Europe and America. Having a correct understanding about the status quo of CBM utilization at home and abroad will help to promote reasonable utilization of CBM in China and solve the energy issues.

Keywords: CBM, utilization, status quo, prospective