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The Speculation of Reason CO₂ Change on Chongqing Xueyu Karst Cave

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With the continuously increase of atmosphere CO₂ which results in global warming, the Earth's carbon cycle is more concerned now. The Earth's carbon cycle not only restricts the varieties of CO₂ concentration but also be affected by geological processes^[1]. CO₂ as one of trace gases in the atmosphere, is a main form of carbon. Therefore the researches about how the geological processes influence carbon cycle are substantial meaningful. There are many studies about carbon cycle mainly through the analysis of chemical reactions of carbon in water and carbonate rocks and impact of atmosphere CO₂ on plants formerly^[3-7]. However there are less studies on influences of geological structures on the chemical reactions of water-rock in karst region. Rock fracture experiments have demonstrated that the carbonate rock would product a large amount of CO₂ after the rock fractured^[2]. Because of the fault activities can make carbonate in the fracture zones release a lot of CO₂, hence it would appear abnormal in the rock fracture districts. It's in favor of fractures development in the stress concentration position^[8-9]. Tectonic fissure controlled by fracture develop follow the strike of fracture, so that the developed caves have obvious directivity. Xueyu karst cave is located on the left bank of Dragon River which is a tributary of the Yangtze River. Although the CO₂ concentration shows the seasonal variation, the amount of it is larger than that of caves of the same condition. The predecessors study indicated that it is mainly effected by the natural factors other than anthropogenic influences^[10]. The buried fault offer platforms on making the water react with carbonate sharply and adequately. Therefore the microstructures of host carbonate rock can constrain the variation of cave CO₂. The study will choose the areas existing buried faults and adequate fractures. In order to investigate whether there are signs of existing buried fault, the cave radon content will be measured, which is a relatively simple method of all over the geophysical

exploration to look for buried geological structures^[11-14]. Generally the radon concentration is not high in limestone areas^[15], but they always can concentrate in the karst caves and karst fractures where they develop well. In this study the radon concentration in water, atmosphere and soil will be observed to look for radon abnormal regions. The rock mineral will be checked using the microscope to get some rock mineral evidences to demonstrated whether the research area exists buried fracture or not.

Key words: CO₂ change ,Buried faults, Radon measure, Rock mineral, Karst cave

References

- YUAN Daoxian,A.J.,2011.Review and Prospects of Study between Geology Process and Carbon Cycle. *Chinese Science Bulletin*.56(26):2147.
- LIN Yuan-wu, ZHAI Shenghua,ect.A.J.,1994.Abnormal Characteristic Study of CO₂ in Different Deep of Buried Faults. *North China Earthquake Sciences*.12(3):36-42.
- JIANG Qian, LI Xin-qing, DING Wen-ci,ect.A.J.,2006. Geochemistry of System in Karst Regions and Atmospheric CO₂:Thermodynamic Studies. *Bulletin of Mineralogy , Petrology and Geochemistry*.25(3):226-235.
- KANG Zhi-qiang,YUAN Dao-xian, CHANG Yong,ect.A. J.,2011.The Main Controlling Factor of Karst Carbon Sequenstration: About Water Cycle. *Journal of Jilin University(Earth Science Edition)*.41(5):1542-1547.
- Siegfrid FLEISCHER,a.j.,2012.Interaction between N and C in Soil Has Consequences for Global Carbon Cycle. *Journal of Resources and Ecology*.3(1):016-019.
- LV Bao-ying, LIU Zhai-hua, LIAO Chang-jun, SUN Hai-long.A. J.,2006.The Influence of Aquatic Plants on Diurnal Variations of Hydrochemistry in Karst System. *Carsologica Sonica*..25 (4):335-340.
- LIU Zhai-hua, Chris GROVES,YUAN Dao-xian, Joe MEIMAN, JIANG Guang-hui,HE Shiyi.A.J.2003,Study on the Hydrochemical Variations Caused by the Water-Rock-Gas Iteration—an Example from the Guilin Karst Experimental Site. *Hydrogeology and Engineering Geology*.4:13-18.
- ZHONG Jian-hua, Ahmatjan ABDURAHMAN, LI Yange,ect.A. J.,2008. Study on Effect between karstification and Fracture in Carbonate Rocks. *Geological Review*.54(4):485-493

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- TANG Yong, MEI Lian-fu, CHEN You-zhi, et al., 2012. Controlling of Structural Stress Field to the Fractures in Xuanhan-Daxing Region. *Northeastern Sichuan Basin, China. Journal of Geomechanics*. 18(20):120-139.
- WANG Ao-yu, PU Jun-bing, SHEN Li-cheng, HE Yang. A. J., 2010. Natural and Human Factors of CO₂ Concentration Variations in Xueyu Cave, Chongqing. *Topical Geograph*. 30(3):272-276.
- ZENG Ming, DONG Hao-gang, ZHANG Hong-xin, et al., 2012. Application Research of Soil Radon Measurement in Concealed Fault Detection of Middle Segment of Shawan Fault Zone. *Journal of Seismological Research*. 35(3):347-352.
- LIU Chun-lai, TUO Xian-guo, HUANG Lian-mei, YAN Yongping, et al., 2011. The Deduction of the Geological Concealed Fault Based on Underground Radon Measurement. *Geophysical & Geochemistry Exploration*. 35(2):226-229.
- CHEN Xi-quan, CHEN Jie, LUO Xiao-rong, et al., 2011. The Tentative Application of the Geogas (Radon) Measuring Method to the Prospecting for Concealed Ore-bearing Fractures. *Geophysical & Geochemistry Exploration*. 35(6):817-820.
- TENG Yan-guo, ZHENG Jieqiong, et al., 2011. The application of Radon Measurement Technique in the Ground Water Source of Mount Qingyuan, Quanzhou. *Computing Techniques for Geophysical and Geochemical*. 33(1):75-78.
- LI Xue-biao, et al., 2011. Recognition of Radon in Karst City, Guangxi. *Environmental Science and Management*. 36(2):130-132.