收稿日期：2018-08-03
改回日期：2018-11-03

基金项目：中国地质调查局项目“中国矿产地质与成矿规律综合集成和服务”（编号 DD20160346）和“乌蒙山区地质矿产综合调查”（编号 DD20160019）联合资助。

doi: 10.12029/gc2018Z209

论文引用格式：钟婉婷，刘增铁，尹福光，张玙，金灿海. 2018. 中国西南部乌蒙山区矿产地信息数据集[J].中国地质，45(S2):75−82.

数据集引用格式：钟婉婷; 刘增铁; 尹福光; 张玙; 金灿海. 中国西南部乌蒙山区矿产地信息数据集[V1].成都理工大学;中国地质调查局成都地质调查中心[创建机构]，2013 年. 全国地质资料馆[传播机构], 2018−12−31. 10.23650/data.C.2018.P14; http://geodb.ngac.org.cn/geologicalDataJournal/rest/manuscript/manuscriptDetail/8f245482f5fd5172aa6864bd51aa5711

中国西南部乌蒙山区矿产地信息数据集

钟婉婷[1,2]　刘增铁[2*]　尹福光[2]　张玙[2]　金灿海[2]

(1. 成都理工大学，四川 成都 610059；
2. 中国地质调查局成都地质调查中心，四川 成都 610081)

摘要：本数据集在广泛收集中国西南部乌蒙山区各种矿产勘查成果信息数据的基础上，按不同矿种对各类矿产信息进行分类提取、汇总提炼、数据质量检查等环节，提供矿产地基本信息、矿区地质特征、数据集代码三部分属性数据。其中，矿产地属性数据包括矿产地编号、矿种、矿产地名称、交通位置、经度、纬度、矿床成因类型、共生矿、伴生矿、矿床规模、成矿时代等 16 个方面的数据，涵盖自 2013 至 2016 年勘查成果，包括 27 个矿种，1 834 个矿产地。矿区地质特征属性数据包括矿产地、矿区大地构造位置、岩石地层单位、侵入岩、火山岩、变质岩、地质构造特征、围岩蚀变等 14 个方面，涉及 769 个矿床（点）的资料。数据集代码属性数据包括矿种、三级成矿带、四级成矿带、矿床成因类型、矿床规模、地质工作程度、勘查程度等 10 个方面数据。本数据集矿种多样、内容丰富、数据可靠，为该区后续深入开展矿产资源评价、地质科学研究、矿产开发部署提供了重要的基础性参考数据资料。

关键词：矿产地；找矿成果信息；数据集；乌蒙山区；中国西南部

数据服务系统网址：http://dcc.cgs.gov.cn

1　引言

从地理与行政归属来看，中国西南部的乌蒙山区地处四川盆地向云贵高原、滇东高原，再向黔中山原丘陵延伸的乌蒙山−大凉山过渡区，行政分区范围主要包括四川、贵州、云南三省毗邻地区的 38 个县（市、区）。从大地构造角度上来看，乌蒙山区位于特提斯−喜马拉雅与濒太平洋两大全球巨型构造域结合部位，也是扬子准地台西南缘。从地层分区角度来看，研究区属于华南地层大区扬子地层区，上扬子地层分区和康滇地层分区，自新太古界至第四系均有出露，可划分为基底和盖层两大部分。褶皱基底为中−新元古界，主要出露有登相营群、会理群、昆阳群。盖层为震旦系、古生界和中−新生界。从造山运动与岩浆作用角度来看，研究区内岩浆侵入作用较发育，澄江期发育早震

第一作者简介：钟婉婷，女，1982 年出生，工程师，主要从事矿床成矿规律与成矿预测研究；E-mail：67027693@qq.com。
通讯作者简介：刘增铁，男，1964 年出生，教授级高级工程师，主要从事矿产勘查评价；E-mail：3153076660@qq.com。

旦世火山岩，是基底褶皱成陆后的内碰撞造山作用的产物。加里东–华力西期在康滇地轴形成基性岩群。华力西–印支（燕山）期在拉张环境下产生基性–超基性岩系列，自泥盆纪–石炭纪–二叠纪并一直断续/持续到中三叠世，以晚二叠世为鼎盛时期发育有峨眉山玄武岩（大陆溢流拉斑玄武岩系），广布于研究区的中西部；与其同源的浅成侵入岩–岩墙状、岩床状辉绿岩，与玄武岩形影相随并零星分布；另见有富镁质基性岩浆侵位，形成偏碱性–超基性岩散布多处。喜马拉雅期形成壳–幔混源型富碱浅成–超浅成侵入岩、幔源型碱性岩组合、钾质煌斑岩类及碱性杂岩体。

从矿产地质角度来看，乌蒙山区地处四川盆地 Fe–Cu–Au–油气–石膏–钙芒硝–石盐–煤–煤层气成矿区，与康滇地轴 Fe–Cu–V–Ti–Sn–Ni–REE–Au–石棉–盐类成矿带和上扬子中东部（台褶带）Pb–Zn–Cu–Ag–Fe–Mn–Hg–Sb–磷–硫铁矿成矿带这 3 个Ⅲ级成矿区带的结合部位（宋相龙等，2017）。这里区域成矿地质条件优越，已发现铅锌、铜、铁、磷、煤、铝土矿、硫铁矿的矿床（点）1 834 个（浦路平等，2011；杨剑波，2015、2016；吕志成，2018）。如图 1 所示，该区优势矿种主要有铅锌、铜、煤、磷、铝土矿、硫铁矿、稀土等和特色非金属矿产（玛瑙、方解石、大理石、木纹石、硅石矿、硅藻土等），是西南地区重要的煤化工基地、磷化工基地，以及有色金属工业基地，矿业的开发利用为当地经济社会发展具有重要的带动作用。

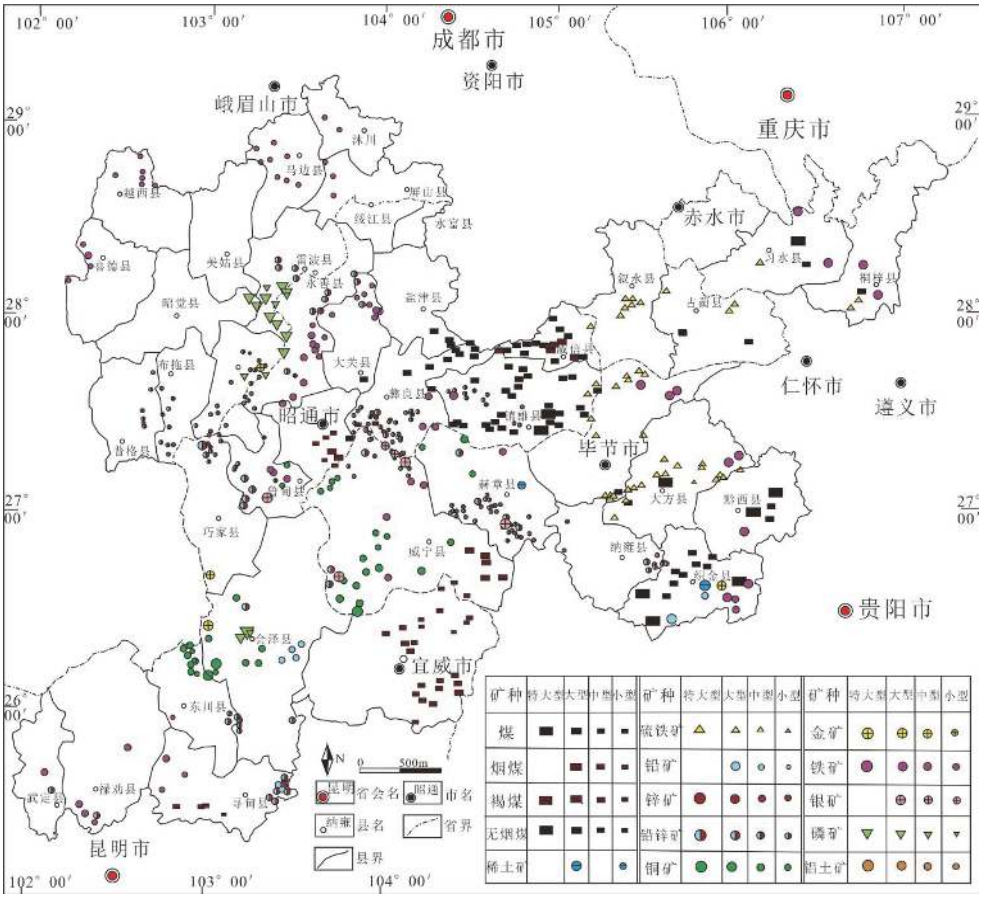


图 1　中国西南部乌蒙山区矿产分布图

2 数据采集和处理方法

2.1 数据基础

中国西南部乌蒙山区矿产地信息数据集，如表 1 所示，是以已有地质资料为基础，补充了该区近年来的普查报告、详查报告、勘探报告、储量核实报告等成果资料，经过综合分类归并形成的。全部资料真实、可靠且有效，符合相关技术要求，数据质量合格。对个别数据内容无法根据相关资料提取有用信息的情况，通过搜集文献资料对内容进行补充。对确实无法补充资料的情况，采取缺项处理。目前该数据集包含的数据为阶段性成果，后续会对数据集进一步完善。

表 1 数据库（集）元数据简表

条目	描述
数据库（集）名称	中国西南部乌蒙山区矿产地信息数据集
数据库（集）作者	钟婉婷，中国地质调查局成都地质调查中心，成都理工大学 刘增铁，中国地质调查局成都地质调查中心 尹福光，中国地质调查局成都地质调查中心 张 玓，中国地质调查局成都地质调查中心 金灿海，中国地质调查局成都地质调查中心
数据时间范围	2013—2016年
地理区域	中国西南部乌蒙山区
数据格式	*.xlsx
数据量	86.4 KB
数据服务系统网址	http://dcc.cgs.gov.cn
基金项目	中国地质调查局项目“中国矿产地质与成矿规律综合集成和服务”（编号DD20160346）和“乌蒙山区地质矿产综合调查”（编号DD20160019）联合资助
语种	中文
数据库（集）组成	本数据集提供了自2013年至2016年中国西南部乌蒙山区27个矿种、1834个矿产地的相关信息，包括：矿产地基本信息、矿区地质特征、数据集代码三部分数据。矿产地基本信息数据包括矿产地编号、矿种、矿产地名称、交通位置、经度、纬度、矿床成因类型、共生矿、伴生矿、矿床规模、成矿时代、三级成矿带、四级成矿带、地质工作程度、开采情况、维护情况等16个方面的数据；矿区地质特征数据包括矿产地、矿区大地构造位置、岩石地层单位、侵入岩、火山岩、变质岩、地质构造特征、围岩蚀变、年龄测定方法种类、同位素地质年龄、采样位置、样品编号、稳定同位素分析方法、稳定同位素地球化学等14个方面，涉及769个矿床（点）的资料；数据集代码包括矿种、三级成矿带、四级成矿带、矿床成因类型、矿床规模、地质工作程度、勘查程度、开采情况、年龄测定方法种类、同位素地质年龄等10个方面数据。

本数据集按照不同矿种进行数据采集，采集过程按照分类整理、数据登记、数据录入共三个步骤完成。在此基础上明确中国西南部乌蒙山区矿产地质特征，填写矿区地质情况数据卡片，如表 2、表 3 所示。

表 2 中国西南部乌蒙山区各矿种矿床（点）统计表

序号	矿种	矿床（点）个数	序号	矿种	矿床（点）个数
1	煤	11	15	钼矿	4
2	无烟煤	331	16	汞矿	2
3	泥炭	5	17	锑矿	2

续表 2

序号	矿种	矿床（点）个数	序号	矿种	矿床（点）个数
4	铁矿	185	18	钛磁铁矿	36
5	锰矿	2	19	金矿	9
6	钛矿	8	20	银矿	16
7	钒矿	5	21	稀土矿	3
8	铜矿	230	22	铀矿	1
9	铅矿	52	23	硫铁矿	107
10	锌矿	29	24	铅锌矿	363
11	铝矿	14	25	菱镁矿	8
12	磁铁矿	22	26	萤石	3
13	镍矿	3	27	磷矿	82
14	钴矿	16			

表 3　中国西南部乌蒙山区矿产信息统计表

矿种规模	超大型	大 型	中 型	小 型	矿（化）点	合 计
煤	8	30	54	461	51	604
硫铁矿	1	22	46	25	13	107
铅锌		5	23	215	187	430
金		2		1	6	9
铝土矿			2	6	6	14
铜		1	6	90	117	220
铁	2	20	9	103	126	260
钛磁铁矿					44	44
磷	2	18	14	14	27	75
银		1	2	4	7	14
菱镁矿		2	2	4		8
稀土矿		1		2		3
硅石		1	1	8		10
石膏				6		6
钴		1	3	11	2	17
钼			4			4
汞				2		2
锑				2		2
钇	1					1
铼多金属				1	2	3
铀				1		1

2.2　矿产地信息提取

全面收集本数据集覆盖区域内已获专家评审通过的可行性报告、普查报告、详查报告、勘探报告，或是经储量评审中心评审通过的储量核实报告等成果资料；在此基础上，补充收集以往项目提交的季报、半年报、年报、年报表等阶段性成果，以及在国内外公开发表或出版的论文、专著中的矿产地信息作为本数据集矿产地信息提取的原始数据。

2.3 数据处理方法

按矿种对收集到的成果资料进行分类整理并依据规模大小进一步细化，对规模较小或勘查程度不高的矿产地从矿产地编号、矿种、矿产地名称、交通位置、经度、纬度、矿床成因类型、共生矿、伴生矿、矿床规模、成矿时代、三级成矿带、四级成矿带、地质工作程度等方面建立数据表，对规模较大且勘查开发程度较高的矿产地在此基础上增加开采情况、维护情况两个方面数据内容，最终汇总完成矿产地基本信息数据表，通过矿产地编号这个纽带建立每个矿产地的关联数据表-“矿区地质特征数据表”，包含矿区大地构造位置、岩石地层单位、侵入岩、火山岩、变质岩、地质构造特征、围岩蚀变、年龄测定方法种类、同位素地质年龄、稳定同位素分析方法、稳定同位素地球化学等重要内容。由于成果资料较多、数据信息巨大，填报工作量繁重，因此对高频出现的词汇采用代码的方式表达，本数据集涉及的矿种、三级成矿带、四级成矿带、矿床成因类型、矿床规模、地质工作程度、勘查程度、开采情况、年龄测定方法种类、同位素地质年龄等内容都可以在代码中找到对应的属性数据，可以根据需要比对数据集代码，查找数据资料，如图 2 所示。

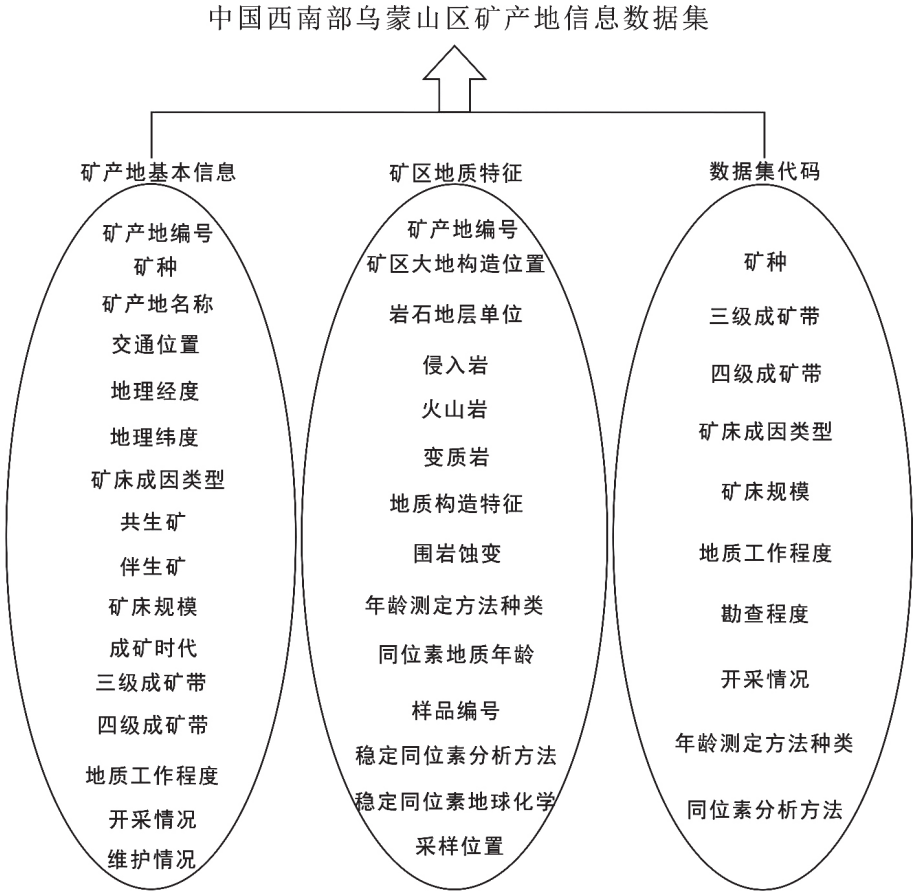


图 2　中国西南部乌蒙山区矿产地信息数据集结构图

3　数据样本描述

中国西南部乌蒙山区矿产地信息数据集（2013—2016 年）为 Excel 表格型数据，包含三个 Excel 数据文件，分别为“矿产地基本信息.xlsx”、“矿区地质特征.xlsx”、“数据集代码.xlsx”。其中“矿产地基本信息.xlsx”数据文件，描述 1834 个矿产地信

息，如表 4 所示；“矿区地质特征.xlsx”数据文件，如表 5 所示；“数据集代码.xlsx”如表 6 所示。

表 4　矿产地基本信息数据表内容

序号	字段名称	数据类型	实例
1	矿产地编号	浮点型	532101005
2	矿种	字符型	无烟煤
3	矿产地名称	字符型	昭阳区德林煤矿
4	交通位置	字符型	昭阳区靖安乡大坪子村，距昭彝路昭通50km
5	经度	浮点型	1034845
6	纬度	浮点型	273318
7	矿床成因类型	字符型	无烟煤级腐殖煤
8	共生矿	字符型	–
9	伴生矿	字符型	–
10	矿床规模	字符型	小型矿床
11	成矿时代	字符型	C_1
12	三级成矿带	字符型	Ⅲ−77−①
13	四级成矿带	字符型	Ⅳ−11
14	地质工作程度	字符型	详查
15	开采情况	字符型	精查
16	维护情况	字符型	建设矿区

表 5　矿区地质特征数据表内容

序号	字段名称	数据类型	实 例
1	矿产地编号	浮点型	532123014
2	矿区大地构造位置	字符型	扬子准地台滇东台褶带滇东北台褶束西缘，巧家−莲峰断裂北西盘，石子坪−杨柳背斜南东翼。
3	岩石地层单元	字符型	主要出露有上震旦统灯影组白云岩、硅质白云岩，顶部是含矿段铅锌矿层的赋存部位；下寒武统筇竹寺组粉砂岩和泥岩，沧浪铺组石英砂岩、泥岩和白云质灰岩，龙王庙组白云岩夹白云质灰岩；第四系残坡积层。
4	侵入岩	字符型	–
5	火山岩	字符型	–
6	变质岩	字符型	–
7	地质构造特征	字符型	矿段处于NE向的向斜构造内，NW翼地层倾向，倾角8度 ~ 12度，SE翼倾向NW，倾角13度。发育次级NW向褶曲。断裂构造有F3、F5、F16三条NW向正断层，倾角60度 ~ 75度，垂直断距40 ~ 60 m，破碎带宽1 ~ 40 m，具铅锌矿化。
8	围岩蚀变	字符型	白云石化、方解石化、硅化、重晶石化、萤石化等。
9	年龄测定方法种类	字符型	氩−氦法
10	同位素地质年龄	浮点型	408.60 Ma
11	采样位置	字符型	Ⅴ矿体、Ⅵ矿层

续表 5

序号	字段名称	数据类型	实 例
12	样品编号	字符型	WTPb
13	稳定同位素分析方法	字符型	铀还原法、碳还原法
14	稳定同位素地球化学	浮点型	^{34}S为2.04±14.29%；^{18}O为5.93%；^{13}C为-7.12%

表 6　数据集代码数据表内容

序号	字段名称	数据类型	实 例
1	矿种	字符型	1001–煤
2	三级成矿带	字符型	73011–Ⅲ–74
3	四级成矿带	字符型	6504–Ⅳ–8
4	矿床成因类型	字符型	0810–沉积矿床
5	矿床规模	字符型	3–中型矿床
6	地质工作程度	字符型	22–普查
7	勘查程度	字符型	22–普查
8	开采情况	字符型	6–未利用资源
9	年龄测定方法种类	字符型	5–C同位素
10	同位素分析方法	字符型	3–C还原法

4　数据质量控制和评估

中国西南部乌蒙山区矿产地信息数据集是以 2013 年以来地质勘查成果为基础，系统收集已有找矿成果资料，并提取其中的有用数据完成的；目前版本的最新数据截止于 2016 年。所有原始数据均来自经过权威评审机构或由行业内高级以上职称专家组成的评审团（组）审定通过的地质矿产领域的科研项目成果报告，或来自国内外正式公开发表、出版的论文及专著等资料，原始数据质量真实可靠。在数据表填报过程中，分为两个工作小组开展工作，每组组长对数据进行全覆盖检查，两组之间对已完成的数据表进行交叉检查，检查比例为 30%，对检查出来的问题及错误，及时进行整改，并由另一个小组确认整改情况并形成整改反馈卡片，以避免收集、整理、填报过程中可能产生的误差，从而保证数据质量的准确性及有效性。

5　结论

中国西南部乌蒙山区矿产地信息数据集反映了乌蒙山区近年来的矿产勘查进展，展示了各矿床（点）的综合信息，既是对地质勘查成果的一个汇总，也是对成果信息的一个综合提升。本数据集原始数据来源真实可信，数据处理方法可靠，创新性地引入“数据代码”的概念，操作简单便捷；全部数据质量可靠，质量控制措施得当；数据量巨大，内容丰富，对于中国西南部乌蒙山区矿产资源潜力评价及资源预测具有重要的参考价值，也为乌蒙山区矿产资源研究提供重要科学数据基础。

致谢：本数据集原始数据特别广泛，都是为中国西南部乌蒙山区矿产勘查付出过艰辛努力的诸多地勘单位及地质工作者们的成果，在此向这些作者和数据原始创建者表达衷心的敬意！

参考文献

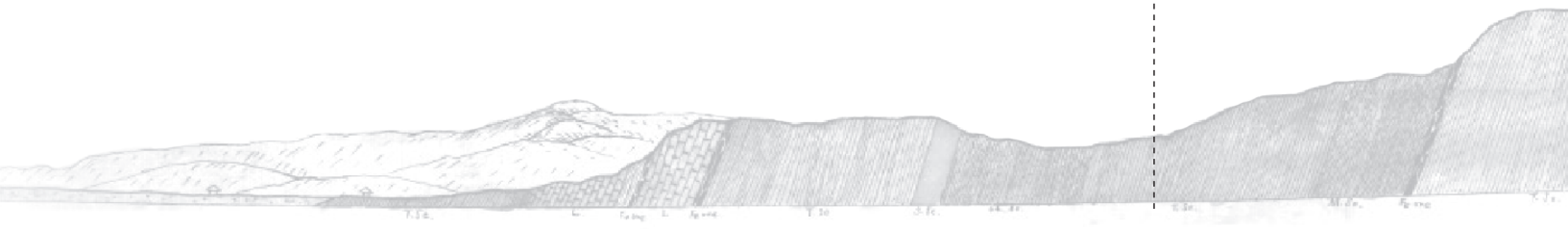
杨剑波. 2015. 黔北煤田官田坝向斜煤气层赋存及潜力分析[J]. 中国煤层气, 12(6): 23−26.

杨剑波. 2016. 黔北煤田官田坝向斜勘查区煤层气赋存及潜力分析[J]. 中国煤炭地质, 28(3): 26−29.

浦路平, 赵鹏大, 胡光道, 夏庆霖. 2011. 基于网格单元的总合式和非总合式结合的区域[J]. 地球科学, 36(4): 740−746.

吕志成, 庞振山, 薛建玲, 耿林, 张志辉, 甄世民, 陶文, 贾儒雅, 陈辉, 姚磊. 2018. 2012—2014 年老矿山深部和外围找矿成果数据集[J]. 中国地质, 45(S1): 1−21.

宋相龙, 肖克炎, 丁建华, 范建福, 李楠. 2017. 全国重要固体矿产重点成矿区带数据集[J]. 中国地质, 44(S1): 72−81.



doi: 10.12029/gc2018Z209

Article Citation: Zhong Wanting， Liu Zengtie， Yin Fuguang， Zhang Yu， Jin Canhai. 2018. Dataset of mineral deposits information in the Wumengshan Region, Southwestern China[J]. Geology in China, 45(S2):98−106.
Dataset Citation: Zhong Wanting; Liu Zengtie; Yin Fuguang; Zhang Yu; Jin Canhai. Dataset of mineral deposits information in the Wumengshan Region, Southwestern China[V1]. Chengdu University of Technology; Chengdu Center, China Geological Survey[producer], 2013. National Geological Archives of China, 2018−12−31. 10.23650/data.C.2018.P14; http://geodb.ngac.org.cn/geologicalDataJournal/rest/manuscript/manuscriptDetail/7cb2d0c1161953759950fc5e14ccb994

Fund Project:
China Geological Survey project " Comprehensive Integration and Services for Mineral Geology and Metallogenic Regularities of China" (Mineral Geology Annals) (No.DD20160346)

Dataset of mineral deposits information in the Wumengshan Region, Southwestern China

ZHONG Wanting [1,2], LIU Zengtie [2*], YIN Fuguang [2], ZHANG Yu [2], JIN Canhai [2]

(1. *Chengdu University of Technology*, *Chengdu* 610059, *Sichuan*;
2. *Chengdu Center*, *China Geological Survey*, *Chengdu* 610081, *Sichuan*)

Abstract: This dataset was established based on extensive collection of information on the results from various mineral explorations in the Wumengshan Region, Southwestern China. The data are presented in three sections: mineral deposit's basic information, mineral deposit geology, and dataset codes obtained by processing mineral deposits information of different mineral species as systematic classification, extraction, summarization and refining, and data quality inspection. The attribute data information on mineral deposit include mineral deposit's number and name, mineral species, location, latitude and longitude, genetic type of deposit, paragenetic deposit, associated deposit, deposit scale and formation age, etc.. The data represent exploration results from 2013 to 2016, covering 27 mineral species and 1,834 mineral deposits. The data information on mineral deposit geology include mineral deposit's number, geotectonic location, litho−stratigraphic unit, intrusive rock, volcanic rock, metamorphic rock, geological structure feature and alteration of wall rock, etc. for 769 mineral deposits. The data information on dataset codes include mineral species, Level-III and Level-IV metallogenic belts, genetic type of deposit, deposit scale, geological work level, and exploration intensity, etc.. This dataset contains abundant and credible data for a wide range of mineral species, providing important fundamental reference data for subsequent in-depth mineral resource evaluation, geological scientific research and mineral development deployment over the region.
Key words: Mineral deposit; mineral prospecting information; Dataset; Wumengshan Region; Southwestern China
Data service system URL: http://dcc.cgs.gov.cn

About the first author: ZHONG Wanting, female, born in 1982, engineer, mainly engages in researches on metallogenic prognosis and regularities; E-mail: 67027693@qq.com.
The corresponding author: LIU Zengtie, male, born in 1964, professorate senior engineer, mainly engages in mineral exploration assessment; E-mail: 3153076660@qq.com.

1 Introduction

The Wumengshan Region is located in Wumeng Mountain−Daliang Mountain transitional area extending from Sichuan Basin to Yungui Plateau and Diandong Plateau, then extending to the hilly land in the center of Guizhou. It administratively covers 38 counties (cities and districts) which are adjacent in Sichuan, Guizhou and Yunnan. Tectonically, the Wumengshan Region is located at the junction of two giant tectonic domains, namely, Tethys−Himalaya and the Peri−Pacific, as well as in the southwestern margin of the Yangtze Craton. Stratigraphically, the research area falls in the Upper Yangtz and Kangdian sub-regions within the Yangtz region of the South China Grand Stratigraphic Region, where Neoarchean to Quaternary rocks outcrop, and can be divided into basement and covering strata. The folded basement is made up of Mesoproterozoic and Neoproterozoic, with such main outcrops as the Dengxiangying Group, Huili Group and Kunyang Group. The covering strata are Sinian, Paleozoic, Mesozoic and Cenozoic. Igneous intrusions are developed within the research area and Early−Sinian volcanic rocks in Chengjiang Period formed by inner collision orogeny. Mafic rock swarms were developed in the Kangdian Earth Axis during the Caledonian−Variscan Period. The mafic−ultramafic rock series were formed in an extensional environment during the Variscan−Indosinian (Yanshan) period, which continued from Devonian−Carboniferous−Permian intermittently or continuously to Middle Triassic. They were developed to the peak in the late Permian when Emeishan basalts (continental flooding tholeiitic basalt series) occurred, widely distributed over the midwest of the research area; the homologous hypabyssal intrusive rocks−diabase dykes and sills are sporadically distributed and closely associated with the basalts. In addition, a number of sporadic alkaline−ultrabasic rocks derived from emplacement of Mg-rich basic magma were dispersed. During the Himalaya orogeny period, mixed crust−mantle derived alkali-rich hypabyssal−ultra-hypabyssal intrusive rock, mantle-derived alkaline rock combinations, potassic lamprophyre rocks and alkaline composite pluton were formed.

The Wumengshan Region is located at the junction of three Level-III metallogenic belts (areas): the Fe−Cu−Au−Oil & Gas−gypsum−glauberite−halite−coal−coal gas metallogenic area in Sichuan Basin, Fe−Cu−V−Ti−Sn−Ni−REE−Au−Asbestos−salt metallogenic belt at Kangdian Earth Axle and Pb−Zn−Cu−Ag−Fe−Mn−Hg−Sb−P−Pyrite metallogenic belt in mid-east region of Upper Yangtz (platformal fold belt) (Song XL et al., 2017). In the region, 1834 deposits (occurrences) have been found, including Pb-Zn, Cu, Fe, P, coal, bauxite and pyrite (Pu LP et al., 2011; Yang JB, 2015 and 2016; Lyu ZC et al., 2018). As an important base for coal and phosphorus chemical industries and nonferrous metal industry in southwestern China, this region is endowed with the dominant mineral species such as Pb−Zn, Cu, coal, P, bauxite, pyrite and rare earth etc., and distinctive non-metal minerals (agate, calcite, marble, serpeggiante, quentzite ore and kieselguhr etc.), as shown in Fig. 1. Therefore, the development and exploitation of mining have great contribution to the local economic growth.

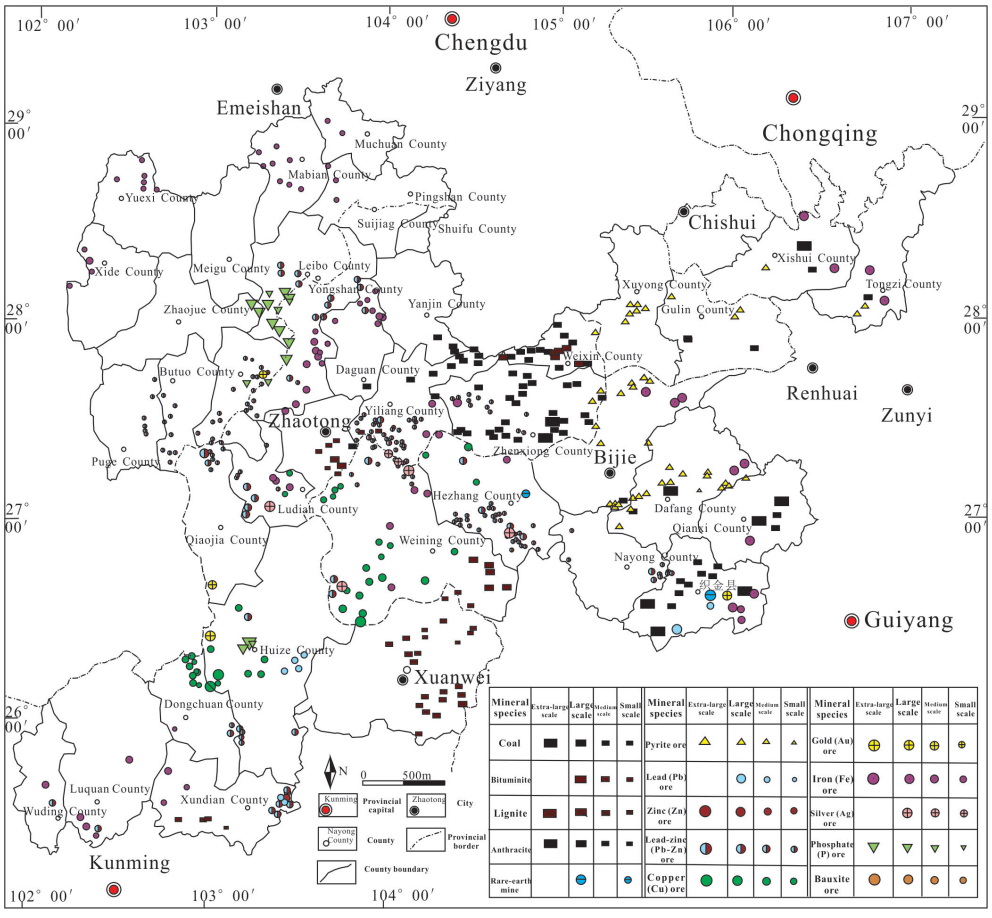


Fig. 1 Mineral resources distribution map of Wumengshan Region, Southwestern China

2 Data Acquisition and Processing Method

2.1 Data Acquisition

The Mineral Deposits Information Dataset of the Wumengshan Region in Southwestern China, as listed in Table 1, was created by summarizing, classifying and collating information of general survey reports, detailed survey reports, exploration reports and reserves verification reports prepared for this region in recent years on the basis of the existing geological data and information. All information is reliable and valid, meeting relevant technical requirements, and data quality is acceptable. Some data items were sourced from literature for absent relevant information. It was treated as a missing item in case of no supplemental information. At present, the dataset is phased acquired results, which will be further refined.

Table 1 Metadata table of Database (dataset)

Items	Description
Database (dataset) name	Dataset of Mineral Deposits Information in the Wumengshan Region, Southwestern China
Database (dataset) authors	Zhong Wanting, Chengdu Center, China Geological Survey Liu Zengtie, Chengdu Center, China Geological Survey Yin Fuguang, Chengdu Center, China Geological Survey Zhang Yu, Chengdu Center, China Geological Survey Jin Canhai, Chengdu Center, China Geological Survey
Data acquisition time	2013—2016

Continued table 1

Items	Description
Geographic area	Wumengshan Region, Southwestern China
Data format	.xlsx
Data size	86.4 kB
Data service system URL	http://dcc.cgs.gov.cn
Fund project	"Comprehensive Integration and Services for Mineral Geology and Metallogenic regularities of China (No.DD20160346). Geological Mineral Comprehensive Survey in the Wumengshan Region (No.DD20160019)"
Language	Chinese
Database (dataset) composition	This dataset contains information on 27 mineral species and 1,834 mineral deposits of the Wumengshan Region of Southwestern China from 2013 to 2016, including three sections: mineral deposit's basic information, mineral deposit geology and dataset codes. Data on mineral deposit's basic information include mineral deposit's No. and name, mineral species, location, longitude and latitude, genetic type of deposit, paragenetic deposit, associated deposit, deposit scale and formation age, Level-III and Level-IV metallogenic belts, geological work level, mining situation, and maintenance. Data on mineral deposit geology include mineral deposit's number, tectonic setting, litho-stratigraphic unit, intrusive rock, volcanic rock, metamorphic rock, geological structure feature, alteration of wall rock, dating methods, isotopic age, sampling location, sample No., analytical method of stable isotopes, and stable isotope geochemistry, involving 769 mineral deposits. Data on dataset codes include mineral species, Level-III and Level-IV metallogenic belts, genetic type of deposit, deposit scale, geological work level and exploration intensity.

For this dataset, the data were acquired by different mineral species in three steps: classification and collation, data registration, and data entry. On this basis, the mineral geological features in the Wumengshan Region of Southwestern China were defined, and the data cards on mineral area's geological situation were completed as shown in Tables 2 and 3.

Table 2 Summary of deposits (occurrences) of mineral species in the Wumengshan Region, Southwestern China

No.	Mineral species	Number of deposits (occurrences)	No.	Mineral species	Number of deposits (occurrences)
1	Coal	11	15	Molybdenum	4
2	Anthracite	331	16	Mercury	2
3	Peat	5	17	Antimony	2
4	Iron	185	18	Titanium magnetite	36
5	Manganese	2	19	Gold	9
6	Titanium	8	20	Silver	16
7	Vanadium	5	21	Rare earth	3
8	Copper	230	22	Uranium	1
9	Lead	52	23	Pyrite	107
10	Zinc	29	24	Lead-zinc mine	363
11	Aluminum	14	25	Magnesite	8

Continued table 2

No.	Mineral species	Number of deposits (occurrences)	No.	Mineral species	Number of deposits (occurrences)
12	Magnetite	22	26	Fluorite	3
13	Nickel	3	27	Phosphate	82
14	Cobalt	16			

Table 3 Summary of mineral deposits information in the Wumengshan Region of Southwestern China

Mineral scale	Deposit scale					
	Ultra-large	Large	Medium	Small	Mineral occurrence (mineralization)	Total
Coal	8	30	54	461	51	604
Pyrite	1	22	46	25	13	107
Lead and zinc		5	23	215	187	430
Gold		2		1	6	9
Alumina			2	6	6	14
Copper		1	6	90	117	220
Iron	2	20	9	103	126	260
Titanomagnetite					44	44
Phosphate	2	18	14	14	27	75
Silver		1	2	4	7	14
Magnetite		2	2	4		8
Rare-earth		1		2		3
Silica		1	1	8		10
Gypsum				6		6
Cobalt		1	3	11	2	17
Molybdenum			4			4
Mercury				2		2
Antimony				2		2
Yttrium	1					1
Rhenium polymetal				1	2	3
Uranium				1		1

2.2 Extract Information on mineral deposit

Comprehensive information and results are from available reports, general survey reports, detailed survey reports and exploration reports. Reports were reviewed and approved by corresponding experts, or reserves verification reports were approved by the Reserves Verification Center, located within the research area. On this basis, raw data on mineral areas were collected complementarily from phased achievements such as quarterly reports, semi-yearly reports, annual reports and annual statements submitted by previous projects, as well as articles and monographs already published.

2.3 Data Processing

Collected information and data were classified and collated by mineral species and then

refined based on their scales. For mineral areas with a smaller scale or a lower exploration intensity, datasheets were created with such items as mineral area's number and name, mineral species, traffic location, longitude and latitude, genetic type of deposit, paragenetic deposit, associated deposit, deposit scale and formation age, Level-III and Level-IV metallogenic belts, and geological work level. For mineral areas with larger scale and a higher exploration intensity, in addition to above-mentioned items, data concerning the mining situation and maintenance were added. Finally, all the data were summarized to complete the mineral area's basic information datasheets. By correlating individual mineral areas using their mineral area'numbers, the Datasheet of Geological Characteristics of Mine Areas was set up, indicating the mineral area's geotectonic location, litho-stratigraphic unit, intrusive rock, volcanic rock, metamorphic rock, geological structure feature, wall-rock alteration, dating method, isotope age, analytical methods of stable isotopes, and stable isotope geochemistry. A substantial number of results and vast amounts of data led to a heavy workload in regards to data entry. To deal with this, high frequency terms were expressed with codes. Data on mineral species, Level-III and Level-IV metallogenic belts, genetic type of deposit, deposit scale, geological work level, exploration intensity, mining situation, dating method, and analytical method of isotopes can be identified by corresponding codes, and dataset codes can be compared where necessary to find data as shown in Fig. 2.

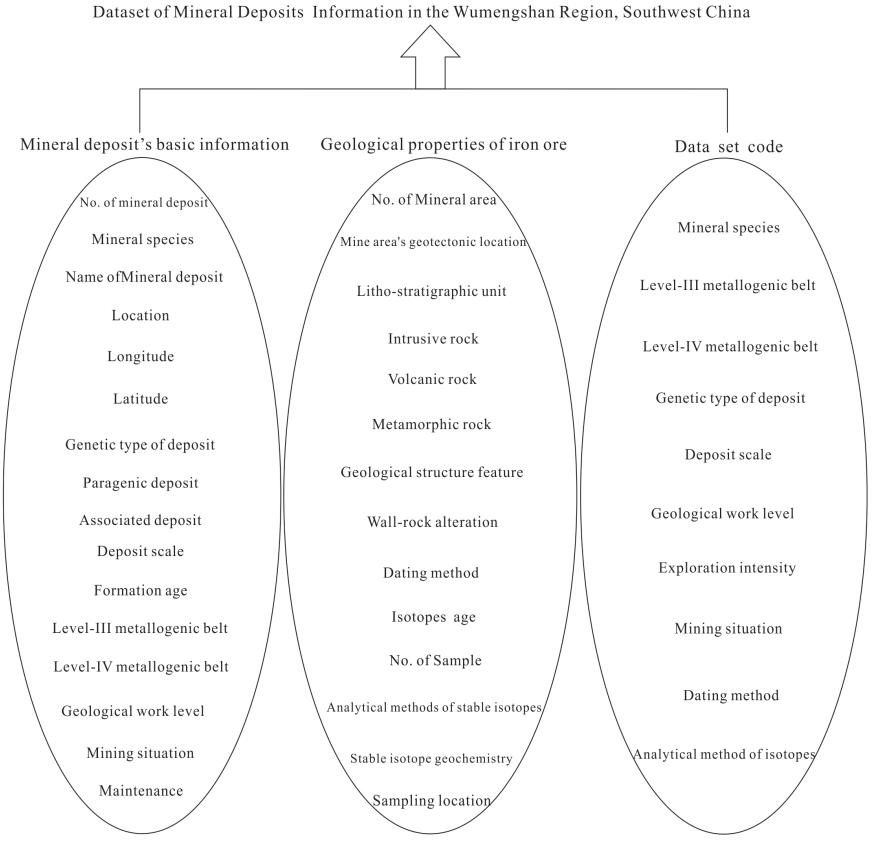


Fig. 2 Structural figure of mineral deposits information dataset of the Wumengshan Region in Southwest China

3 Description of Data Samples

The Mineral Deposits Information Dataset of the Wumengshan Region of Southwestern China (2013—2016) consists of three Excel files: *Mineral Deposit's Basic Information.xlsx*, *Mineral Deposit Geology.xlsx* and *Dataset Codes.xlsx*. *Mineral Deposit's basic Information.xls* describes the information of 1,834 mineral areas as shown in Table 4; *Mineral Deposit Geology.xlsx* and *Dataset Code.xlsx* are respectively shown in Table 5 and Table 6.

Table 4 Datasheet of Mineral Deposit's Basic Information

No.	Field name	Data category	Real example
1	Mineral area No.	Floating-point type	532101005
2	Mineral species	Character type	Anthracite
3	Mineral deposit's name	Character type	Delin Coal Mine, Zhaoyang District
4	Location	Character type	Dapingzi Village, Jing'an Town, Zhaoyang District, 50 km from Zhaotong by Zhaoyi road
5	Longitude	Floating-point type	1034845
6	Latitude	Floating-point type	273318
7	Genetic type of deposit	Character type	Humanthracite
8	Paragenetic deposit	Character type	–
9	Associated deposit	Character type	–
10	Deposit scale	Character type	Small-scale deposit
11	Formation age	Character type	C_1
12	Level-III metallogenic belt	Character type	Ⅲ-77-①
13	Level-IV metallogenic belt	Character type	Ⅳ-11
14	Geological work level	Character type	Detailed survey
15	Mining situation	Character type	Precise survey
16	Maintenance	Character type	Mine area under construction

Table 5 Datasheet of Mineral Deposit Geology Information

No.	Field name	Data category	Real example
1	Mineral deposit No.	Floating-point type	532123014
2	Geotectonic location	Character type	Platformal fold belt of Yangtze paraplatform, west margin of northeast Yunnan Fold, northwest plate of Qiaojia−Lianfeng Fracture, and southeast wing of Shiziping−Yangliu anticline.
3	Litho-stratigraphic unit	Character type	Main outcroppings are upper-Sinian Dengying−Formation dolomite and siliceous dolomite, and the top is the occurrence site of Zn−Pb deposits of ore-bearing section; lower Cambrian Qiongzhusi Formation siltstone and mudstone, Canglangfu Formation quartz sandstone, mudstone and dolomite limestone, Longwangmiao Formation dolomite interbedded with dolomite limestone; Quaternary residual slope sediment.
4	Intrusive rock	Character type	–
5	Volcanic rock	Character type	–
6	Metamorphic rock	Character type	–

Continued table 5

No.	Field name	Data category	Real example
7	Geological structure feature	Character type	The ore block is within a NE-strike syncline structure, the NW wind dips at the angle of 8 ~ 12 degrees and the SE wing dips toward NW at the angle of 13 degrees. Secondary NW-strike fold developed. For fractured structure, there are three NW-direction normal faults, i.e. F3, F5 and F16, at the dip angle between 60 ~ 75 degrees, at the vertical fault displacement of 40 ~ 60 m. The broken zone is 1 ~ 40 m wide, with Zn−Pb mineralization.
8	Wall-rock alteration	Character type	Dolomitization, calcilization, silicification, baratization and fluoritization etc.
9	Dating method	Character type	tritium−helium method
10	Isotopic age	Floating-point type	408.60 Ma
11	Sampling location	Character type	V ore body, VI ore bed
12	Sample No.:	Character type	WTPb
13	Analytical method of stable isotopes	Character type	Uranium reduction and carbon reduction
14	Stable isotopes geochemistry	Floating-point type	^{34}S is 2.04±14.29%; ^{18}O is 5.93%; ^{13}C is -7.12%

Table 6 Datasheet of Dataset Codes

No.	Field name	Data category	Real example
1	Mineral species	Character type	1001- coal
2	Level-III metallogenic belt	Character type	73011-Ⅲ-74
3	Level-IV metallogenic belt	Character type	6504-Ⅳ-8
4	Genetic type of deposit	Character type	0810- sedimentary deposit
5	Deposit scale	Character type	3-medium scale deposit
6	Geological work level	Character type	22- general exploration
7	Exploration intensity	Character type	22- general exploration
8	Mining situation	Character type	6- unexploited resource
9	Dating method	Character type	5-C isotope
10	Analytical method of isotopes	Character type	3- C reduction

4 Data Quality Control and Assessment

On the basis of the results from geological surveys since 2013, the Mineral Deposits Information Dataset of the Wumengshan Region of Southwestern China was set up by systematically collecting available information from ore-prospecting activities and extracting their available data; currently, the latest data was acquired in 2016. All raw data come from reports on research projects in the geological and mineral fields approved by authoritative review institutions or review groups whose members are at least senior experts in the sector, or preciously published articles or monographs considered as true and credible. There were two working groups for the filling and submission of datasheets. The leader of each group checked all data involved. Both groups checked mutually the completed datasheets at the percentage of 30%. Any mistakes and problems found in check were corrected in time, and the other group

confirmed corrections and prepared a correction feedback card to avoid any error possibly caused during collection, collation and filling so as to ensure that data were accurate and valid.

5 Conclusion

The Mineral Deposits Information Dataset of the Wumengshan Region in Southwestern China, reflecting the mineral exploration progress in the Wumengshan Region in recent years, provides comprehensive information on various mineral deposits (occurrences). It is not only a summary of results of geological surveys, but also an overall improvement of result information. In this dataset, the sources of raw data are true and credible and the data were processed with reliable methods. The concept "data code" was an innovation introduced for easy and convenient operation. All data are credible and processed under proper quality-control measures. With vast and diversified data, this dataset provides important reference to evaluate mineral resource potential and predict resources in the Wumengshan Region of Southwestern China, as well as lays an important scientific data basis for mineral resource investigation in the Wumengshan Region.

Acknowledgement: We hereby extend our sincere respect to geological survey organizations and geological workers for their hard work in mineral survey in the Wumengshan Region of Southwestern China, especially considering that the dataset contains very widespread, raw data. The authors also want to extend thanks to the anonymous reviewers. Their detailed and specific comments to polish and revise this article resulted in a significantly higher quality.

References

Lyu Zhicheng, Pang Zhenshan, Xue Jianling, Geng Lin, Zhang Zhihui, Zhen Shimin, Tao Wen, Jia Ruya, Chen Hui, Yao Lei. 2018. Dataset of ore-prospecting results surrounding and beneath the Old Mines from 2012 to 2014[J]. Geology in China, 45(S1): 58−97.

Pu Luping, Zhao Pengda, Hu Guangdao, Xia Qinglin. 2011. Joint Area Mineral Resources Potential Assessment Method of Grid-Units-Based Aggregated Form with Disaggregated Form[J]. Earth Science, 36(4): 740−746 (in Chinese with English abstract).

Song Xianglong, Xiao Keyan, Ding Jianhua, Fan Jianfu, Li Nan. 2017. Dataset of major mineralization belts of China's key solid mineral resources[J]. Geology in China, 44(S1): 89−99.

Yang Jianbo. 2015. Analysis of CBM Hosting and Potential of Guantianba Syncline in North of Guizhou Coalfield[J]. China Coalbed Methane, 12(6): 23−26 (in Chinese with English abstract).

Yang Jianbo. 2016. CBM Hosting and Potential Analysis in Guantianba Syncline Exploration Area, Northern Guizhou Coalfield[J]. Coal Geology of China, 28(3): 26−29 (in Chinese with English abstract).