Pegmatites of China bibliography

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China possesses a diversity of pegmatites that span almost all the known types (class-family) of pegmatites. The English literature on these pegmatites is minor for various reasons, language only being one reason but certainly not the only one. Since the start of “reform and opening up” of China by Deng Xiaoping in 1978, the situation has been changing almost yearly. Not only has English language but also Chinese language publications on pegmatites, their location, structure, genesis, age, and mineralogy has been expanding. Most of this material is legally available to non-Chinese.

The bibliography that is associated with this abstract contains all the published literature that I have been able to locate about Chinese pegmatites and some Chinese minerals in general without regard to language or publication origin. This material consists of Chinese and non-Chinese publications, sometimes authored by Chinese scientists and sometimes not. These publications are from scientific journal articles, mineral collector hobbyist magazines, books published by state-owned research institutes, masters and doctorate theses, symposium field trip guidebooks, symposium proceedings, and self-published books by Chinese collectors who want to show off their specimens. Most of the compiled literature was created for domestic audiences not international.

This material was obtained by various means. The numerous used books that typically surround universities sometimes have books of interest. Official Chinese bookstores, some oriented to a general public, some specialized for Chinese scientists will usually have newly published books. Most of the new material can also be purchased online in China. Used scientific books can also be purchased over the internet as can the hobbyist magazines. Most Chinese journal articles can actually be purchased online for ½ an RMB (7 cents US) per page and downloaded. The same articles from non-Chinese vendors is significantly more expensive. The documents that are excluded from this list are the reports in the National Geologic Archives of China (NGAC) in Beijing. These reports are only open to those with special permission from the national government since they contain the basic mapped data with detailed maps and associated reports.

What does this material contain? - some basic descriptions of the pegmatite fields in the Altai mountains, northern Xinjiang (Zou and Li 2006, Luan et al. 1996), a list of all the feldspar and rare-metal pegmatites in the Xinjiang province (Tang et al. 2005), a detailed description of the entire pegmatite field surrounding the Nanping no. 31 pegmatite (Chou and Yang 1985), the muscovite pegmatites of Danba, the unzoned albite-spodumene pegmatites of Ke’eryin and the Complex LCT pegmatites of Jiajika in the Sichuan Province (Li, Wang, Zhang and Fu 2007; Li, Wang, and Fu 2006), the Qinling Mountains pegmatite fields (Chen, et al. 1993) which stretch across Henan, Shaanxi and Gansu provinces, the pegmatite fields on either side of one of the plutons in the Mufushan batholith, Tongcheng County in Hubei (Huang and Hu 2012) and Pingjiang County in Hunan (Li et al 1994), the miarolitic pegmatites in the Inner Mongolia (Wong and Wang 1930; Sun 1933, 1934), the gem pegmatites of Yunnan (Sun et al. 1986, Li 2007), and the NYF pegmatites in Suzhou, Jiangsu (Huang 1949). There are still many more pegmatite fields that have been documented in these and other provinces, so the list above was just to give a feel for what is available.
References Cited


China pegmatite references with annotations

Compiled to 9 July 2016 by Mark Ivan Jacobson

Compilation explanations:

Note on Chinese names: Family names are usually single syllable, are written first and capitalized. Given names are usually but not always two syllables. Chinese characters are used intermittently as seemed appropriate. Due to the lack of diversity in Chinese names, given names are not abbreviated.

Missing or implied information in reference titles has been added for completeness. This information is indicated by square brackets [  ].

Note on Chinese pegmatite names: With only a few exceptions, a pegmatite within a particular pegmatite field is named after the pegmatite field followed by its number which was assigned during the original field mapping work. Thus it is correct to refer to the Jiajika pegmatite field with the famous spodumene deposit as the Jiajika pegmatite No. 134. There is no Jiajika pegmatite nor is there a Kangding pegmatite field. Similarly the most famous pegmatite in the Nanping pegmatite field is the Nanping pegmatite No. 31 pegmatite.

The preferred English spelling of pegmatite field names in this compilation is the official Chinese pinyin transliteration. I am aware that pegmatite names that originated from non-Mandarin words and were translated into Mandarin will end up with a different pinyin spelling than the English spelling directly from the non-Mandarin word. The reason for this choice is that for utilizing Chinese language literature, if you do not know the pinyin spelling, there is no hope in recapturing the correct Chinese characters, even though with the pinyin spelling choosing the correct characters is still a challenge, which even native speakers get wrong.

References


AN, Yinxiang (安银祥). 2006a. The Geological Characteristics of the Emerald Deposit in Tashen Kuergan [(Taxkorgan) County, Tashendi District], Xinjiang [Province]. Xinjiang Non-Ferrous Minerals, V 29, No. 2, p. 9-10 (in Chinese). This locality is next to the border with Tajikistan, so obviously no maps, pictures or figures. This discovery is the first occurrence in China of emerald in carbonate veins, and is not a pegmatite deposit.

AN, Yinxiang. 2006b. Structural Features of the Kelumute Mining District [, Xinjiang Province]. (柯鲁木特矿区帚状构造特征) [J] Xinjiang Non-Ferrous Metals, V 29, No. 1, p. 7-8,10 (in Chinese). One map of the district, river with name, scale bar.


BAI, Feng; FENG, Hengyi; ZOU, Sijie and LIU, Jiao. 2010. Study on Cymatolite from the Guanpo pegmatite deposits in [Guanpo town,] Lushi [county, Sanmenxia Prefecture,] Henan province. *[J] China Non-metallic Mineral Industry Herald*, V 85, No. 5, p. 29-31 (in Chinese with English abstract). No maps. This locality is probably Pegmatite no. 309, near Guangpo village, which is 9.6 km SW of Lushi town, Lushi county, Sanmenxia prefecture, western Henan Province. The village is perhaps 1 km east of the Sha-anxi Province border.


Beus, A. A. 1956. *Beryllium*. W. H. Freeman and Company, San Francisco. 161 p. (English translated text 1962). Text is valuable because some of illustrations are of pegmatites that are identified in later Chinese publications 30 years later. Map of Keketuohai No. 3 pegmatite showing exploratory drifts on page 135, Figure 39. Figure 10, page 50 is a small scale cross section of the Keketuohai No. 3 pegmatite.

Beus, A. A. 1960. *Geochemistry of Beryllium*. W. H. Freeman and Company, San Francisco. 401 p. (English translated text 1966). Text is valuable because some of illustrations are of pegmatites that are identified in later Chinese publications 30 years later. Figure 29, page 194, Dakalasu No. 1 pegmatite cross section.


Blauwet, Dudley, Quinn, E.P., and Muhlmeister, S. 2005. New emerald deposit [Dafdar or Davdar, Tashikuergan] in Xinjiang, China. *Gems and Gemology*, V 41, p. 56–57 (in English). With a color photograph of an emerald specimen. This is the same locality that has been described as at Tashen Kuergan [(Taxkorgan), Xinjiang Province.


CAO, Zhimin(曹志敏); LI, Youguo (李佑国); REN, Jianguo(任建国); LI, Baohua (李保华); XU, Shijin (徐仕进); WANG, Rucheng (王汝成); ZHENG, Lucheye (正路澈也); JIN, Tianbozhang (金田博彰); and XIAO, Linxiangyi (小林祥一). 2002. Geologic and Geochemical Features of the Volatile-rich Ore Fluid and its Tracing and Dating in the Xuebaoding Beryl-Scheelite Vein Deposit, [Sichuan Province.] China. *J[ Science in China, Series D (Earth Sciences)*, V 32, No. 1, p. 64-72 (in Chinese).


CHEN, Fuwen; LI, Huaqin (李华芹); and LU, Yuanfa. 2002. Temporo-spatial distribution of rare metal and REE [pegmatite] deposits in Xinjiang, Northwest China. *Acta Geologica Sinica*, v. 76, no. 4, p 478-487 (in English). Article contains a list of rare-metal and REE pegmatite fields and their location on a regional map. This map was used as the template for ZOU and LI (2006) plate 1 of Xinjiang province. Also contains age dating of variable reliability for many of the pegmatite fields.


CHEN, Jianping; CHEN, Yong; ZHU, Pengfei; WANG, Limei; SHANG, Beichuan; ZHANG, Yingnian; LI, Guojian; and LI, Dejun. 2014. The metallogenic geologic characteristics of pegmatite veins and typical tantalum-niobium ore deposit, Lushi County, Henan [Province]. Conservation and utilization of mineral resources, August, no. 4, p. 13-17 (In Chinese with English abstract). Contains one pegmatite map, same as the one in Lu, et al (2010), figure 4.


CHEN, Xiangdong. 2008. Geological characteristics of Donghu pegmatite deposit of [Donghu Cun, Jiaowei Town,] Xianyou county [Putain prefecture] in Fujian province and genetic analysis [J]. *Geology and Mineral Resources of South China*; No. 1, p. 59-64. Contains a geologic map with scale bar but no place names. Jiaowei town (Zhen) is located southeast of Xianyou county seat town.


CHEN, Xijing (陈西京); WANG, Shurong (王淑荣); and ZHANG, Xiuyin(张秀颖).1993. *Geological Features and Mineralization of Granitic Pegmatites in Qinling*. Beijing: Publishing House of Geology, 75 p. (in Chinese). The book, contains p. 5-regional geologic map, no scale bar, several place names (An-ding, Tianshui, Xian and others (Gansu and Sha-anxi Provinces), p. 9 geologic map of Ningsha-an pegmatite district, with scale bar, two place names, Sha-anxi Province, p. 9 geologic map of the Baoji pegmatite district, scale bar, two place names (Taibai and Baoji), Sha-anxi province, p. 11 geologic map of Shangnan pegmatite district, no scale bars, several place names, Shangnan county, Eastern Sha-an Xi province, p. 13 geologic map, no place names, no scale bar but possible 1 km tick marks along sides, p. 16 geologic map of , p. 17 geologic map of no place names, no geographic features, probably 1 km labeling along sides, p. 17 geologic map of, no place names, no scale bar but apparent 1 km grid lines on map, unlabeled town shown, rivers on map, p. 60 geologic pegmatite map of un-named district, no scale, no place names, only north arrow. Very valuable resource for describing pegmatites in Shaanxi province.


CHEN, Xijing. 1981. Pollucite formation conditions and criteria from several pegmatites in China. *Journal of Chang’an University (Earth Science Edition)*. p. 47-57 (in Chinese). One possible map but several cross sections of different pegmatites, also sketches showing graphic occurrences of pollucite. Since Chen did lots of work in the Qinling Mts, these pegmatites might be from his area. Pollucite =铯榴石 = seliushi= sometimes translated as cesium garnet.


CHEN, Zhenghui (陈郑辉); WANG, Denghong (王登红) GONG, Yufei (龚羽飞); CHEN, Yuchuan (陈毓川); and CHEN, Shiping (陈世平). 2006. 40Ar-39Ar Isotope Dating of Muscovite from the Jingerquan Pegmatite Rare Metal Deposits in Hami [City district], Xinjiang [Province], and Its Geological Significance. [J] Mineral Deposits (礦床地質), V 25, No.4, p. 470-476 (in Chinese with an English abstract). Article has 2 maps and one cross section of a pegmatite.


Chengdu College of Geology, 7th teachers and researchers group in the Second Department. 1974. Pollucite from a rare metal pegmatite in the area of [probably Mufu Shan pegmatite district in Hunan or the district in Tongcheng town, Xianning prefecture, Hubei province] south-middle of China. [J] Chengdu College of Geology, p. 53-56 (in Chinese). No maps, lots of sketches of mineral samples showing intergrowth of different minerals with pollucite.


CHOU, Nianming and YANG, Yueqing. 1985. Nanping Pegmatite Field, Fujian Province: Research report on its formation, mineralization and prospecting approach. Published by Fujian Provincial Bureau of Geology and Mineral Resources and Chinese Academy of Geological Sciences Institute of Mineral Resources. 236 p. (in Chinese with English abstract), Hardcover. Based on work done between 1983 to 1985. The above named authors, compiled this book, 9 others are listed as colleague researchers. This book is the most important reference for the Nanping pegmatite field, contains 1,500,000 geologic map, detailed pegmatite maps, a 1:50,000 pegmatite location map with numbered pegmatites, including the most intensively described pegmatite, No. 31. Individual pegmatite cross sections include No. 31. No. 31 is exhibited in an exploded block diagram, and two internal structure cross sections. All the major minerals are described with chemical analyses as were available. Black and white photographs of rock exposures with mineral textures.


FAN, Liangming; MAO, Yuyuan; WAN, Yongwen; and LUAN, Shiwei. 1994. Discovery of eucryptite and (hectorite) swinefordite in no. 3 pegmatite vein, Keketuohai district, Xinjiang, China. Journal of Mineralogy and Petrology, V 15, no. 1.


FU, Xiaofang; HOU, Liwěi; WANG, Dènghóng; YUAN, Liping; LIANG, Bin, HAO, Xuēfēng, and PAN, Méng. 2014. The results of the mining and mineral investigation of the Jiajika spodumene quarry, Ganzi prefecture, Sichuan Province. China Geological Survey, V 1, no 3 (December), p. 36-43 (In Chinese). Map of pegmatite field with some pegmatite numbers-location of x03 pegmatite which is described in another report.


GU, Lianxing; ZHANG, Zunzhong; WU, Changzhi; GOU, Xiaqin; LIAO, Jingjuan; and YANG, Hao. 2011. A topaz- and amazonite-bearing leucogranite pluton in eastern Xinjiang, NW China and its zoning. [J] *Journal of Asian Earth Sciences*, V 42, No. 5, October 2011, p. 885-902 (in English). Mentions three small pegmatites within the granite that contained 1 to 2 cm long
beryl crystals, also provided a list of the minerals within this granite. A scenery photograph of the locality shown as well as index maps with latitude and longitude.


English abstract). Hardcover book. Kuiqi granites near the Gushan intrusion, northeast of Fuzhou on the coast. Lists all the miarolitic granite names in a coastal map. Can be used to identify and confirm the name of the miarolitic granite at Tongbei.


HU, Weizheng; HUANG, Xiaowen; and XIE, Zhendong. 2006. Geological Characteristics and Prospect Foreground of Spodumene Deposits in the Xigang-Langjing Area [Guangchang county, Fuzhou prefecture], Southern part of the Jiangxi Province; Journal of East China Institute of Technology; No. S1 (supplement 1) [NE of Ningdu and N of Shicheng counties], p. 187-194 (in Chinese with English title). Contains several maps with easting and northing coordinates along its edges. This pegmatite area is the same one described in Hu, Huang and Huang (2005).

HU, Weizheng (胡为正), HUANG, Junping; and HUANG, Xiaowen. 2005. Characteristics and genesis of pegmatite type Nb-Ta spodumene deposit in Xigang, south[ern part of the]
Jiangxi [Province]. [J] Resources Survey and Environment, V 26, no. 4, p. 258-266 (In Chinese with English Abstract). Contains cross sections with scale bar, and a pegmatite map with coordinates, scale bar and place names. This pegmatite field is the same as the one described in Hu, Huang and Xie (2006).

HU, Yuandi. 1965. The mineralogy, geology and geochemical characteristics of an area containing pegmatites. [J] Geology. (Nov) V 23, No. 6, p. 454-462, two B&W plates (in Chinese). Two geologic maps, scale bar, no culture or coordinates. B&W pictures of pocket crystals of smoky quartz, microcline and cleavelandite. Should be useful if the text tells where these pegmatites are located.


HUANG, Shiyao (黄世尧) and HU, Jinwang (胡金旺). 2012. The geological characteristics and prospects for the development and utilization of the feldspar from the granitic pegmatites at Duanfeng Shan, Tongcheng County, Hubei Province. Western Resources, p. 122-123 (in Chinese). contains a geologic map with the pegmatites, no culture but it does have a scale bar.

HUANG, Jie; ZHENG, Yongfei; ZHAO, Zifu; WU, Yuanbao, ZHOU, Jianbo; and LIU, Xiaoming. 2006. Melting of subducted continent: Element and isotopic evidence for a genetic relationship between Neoproterozoic and Mesozoic granitoids in the Sulu Origin. Chemical Geology, V 229. p. 227-256. (in English). Discusses and mentions the Mesozoic, A-type granite, Wulian Shan miarolitic pluton (p. 229-230 with index map) which contains the miarolitic cavities with smoky quartz that have as their locality, Jietou town (Zhen), Wulian county, Rizhao Prefecture, Shandong Province. Jietou is surrounded by a great number of dimension-stone granite quarries. Except for quarrying, this is an agricultural area.


HUANG, Xiaolong; CHEN, Xiaoming and CHEN, X M. 2002. Vertical variations in the mineralogy of the Yichun topaz lepidolite granite, Jiangxi Province, South China: Canadian Mineralogist, V 40, no. 4, p. 1047-1068 (in English).


Jiang, Chenghuan and Zhang, Rufang. 2012. Gem-quality topaz characteristics and prospecting opportunities in northeast Guangxi and southwest Hunan Provinces. *Geological Society of Guangxi*, 9 p. (in Chinese) Two colored pictures of topaz, one page of crystal drawing and an excellent map showing potential gemstone areas. This area seems to be within the Limu mining district. An internet downloaded article.


Metallogenesis and usability of Tantalum-Niobium tin bearing pegmatites of Hengshan district, Guangning, Guangdong Province, PRC: final report; Contract RG-8313-5 Part 1 Geological and structural mapping 1:10,000 and aspects to a metallogenetic model in tantalum / niobium rocks around Hengshan.


LI, Jiankang (李建康), and CHOU, Iming. 2014. An Occurrence of H2 in silicate melt inclusions in quartz from granite of Jiajika granitic pegmatite deposit, China. 11th International GeoRaman Conference., St. Louis, Missouri. (abstract in English), 2 p.


LI, Jiankang (李建康), WANG, Denghong; CHEN, Zhenghui; and WANG, Denghong. 2008. Ore-forming epoch and tectonic tracing of typical pegmatite deposit in western Sichuan Province, China. The 33rd International Geological Congress, Oslo, August 6-14, 2008 (Abstract only, in English).

LI, Jiankang; WANG, Denghong; CHEN, Yuchuan. 2013. The ore-forming Mechanism of the Jiajika Pegmatite [field] – Type Rare Metal Deposit in Western Sichuan Province: Evidence from Isotope Dating. *Acta Geologica Sinica* (English Edition). v. 87, no. 1, p. 91-101. paper reproduces field map, unreliable scale bar, no coordinates with only two pegmatites named. Pegmatite types may not match original thesis map but translated pegmatite types might be useful. First paper to actually mention other minerals from the pegmatite field: beryl, thorite, cyrtolite variety zircon, manganisicklerite [incorrect name for sicklerite], spodumene, khlopinite [a discredited mineral name of titanian samarskite-(Y)] and kymatolith (cymatolite - a term for an albite-muscovite intergrowth that is pseudomorphous after spodumene). Other minerals that
can be inferred from this are: purpurite, lithiophilite, and eucryptite. Paper uses different methods of age dating which give different ages to infer a cooling history of the parental granite and its pegmatites.


LI, Qiaojiang. 2009. China’s Aquamarine Gemstone Countryside. In: Xinjiang Humanities Geography [Cultural Geography of Xinjiang], 8 p. (in Chinese). Color magazine article with several aquamarine crystal pictures, and two pictures of the Keketouhai no. 3 quarry pit.


LI, Taide; and CHENG, Jian. 2004. Geological Characteristics of the Kelumute Lithium-Tantalum-Niobium Deposit No. 228 Vein, Fuyun County[, Xinjiang Province.] Mineral Resources and Geology, V 18, No.5, p. 427-231 (in Chinese). 1 sketch map of pegmatite with a scale bar, geology on map, no culture- pegmatite district given as E 89 degrees, 5’, 30” to 89 degrees, 7’ and 00” by N 47 degrees, 54’ and 30” to 47 degrees, 56’ and 15”. Another newspaper account gives this pegmatite district location as 77 km northeast of Altay City at between E 89 degrees, 5’ and 16” to E 89 degrees, 7 min and 15 sec AND N 47 degrees, 54 min, 38 sec to 47 degrees, 55 min and 20 sec. The paper stated that there are 76 pegmatite veins in the district.


LI Zhaolin (李兆麟); YANG, Rongyong; and LI, Wen. 1999. Pegmatite fluids of different origins and their implications for Mineralization. Chinese Journal of Geochemistry, v. 18, no. 1, p. 9 - 17 (in English).


LI, Zhenzhen; TIAN, Shihong; HOU, Zengqian; SU, Aina; LI, Jiankang; and YANG, Zhusen. 2010. The Lithium isotopic characteristics of the Jiajika rare-metal deposit in Sichuan, China. (abstract), Goldschmidt Conference, Knoxville, Tennessee, June 13-18, p. A600. (in English).


LIU, Changshi; HUANG, Xiaolong; WANG, Rucheng; YIN, Lin; CHEN, Xiaoming; and CHEN, Peirong. 1998. Some high-P-Subtype and low-P-subtype F-rich Granites in South China. Chinese Journal of Geochemistry, v. 17, no. 4, p. 320 - 330 (in English).


LIU, Feng; ZHANG, Zhixin; LI, Qi; ZHANG, Chao and LI, Chao. 2014. New Precise Timing Constraint for the Keketuaohai No. 3 Pegmatite in Xinjiang, China, and Identification of its Parental Pluton. *Ore Geology Reviews*, v. 56, no. 10, p. 209-219 (in English).


LIU, Yan; DENG, Jun; CAI, Keqin; ZHOU, Yan; WANG, Qingfei; ZHOU, Yinghua; GAO, Bangfei; LI, Dexiu; XU, Fuyu; and ZHU, Yuerong. 2005. Mineralogical characteristics of beryl in Pingwu County, Sichuan Province, Southwest China. [J], Earth Science Frontiers, (China University of Geosciences and Peking University, Beijing), V 12, No. 2, p. 324-331. (in Chinese with English abstract). Article has 2 crystal drawings from Rocks & Minerals, and colored pictures which include a colored tourmaline with gem quartz from Pingwu. Colored tourmaline has never been observed from the Pingwu deposit – the specimen may have had the green tourmaline glued on.


LIU, Yan; HE, Mingyue; ZHANG, Dalin; YU, Xiaoyan; and PAN, Zhaolu. 2001. Gemology of beryl from Pingwu, Sichuan Province [J]; Journal of Gems & Gemology; 2001-03


LIU, Youhua; LI, Kangdong; and TU, Jinfeng. 2011. Geological characteristics and genesis of Huangshan niobium (tantalum) deposit in Geyuan, Jiangxi province. Resources Survey &
Environment, V 32, No. 4, p. 291-298 (In Chinese with English Abstract). With maps on p. 292, regional district geological map with scale bar, place names, p. 295, detailed geologic map, scale bar, place names, p. 296, close-up pegmatite map, scale bar, no place names.


LU, Deshi. 1993. Classification of granitic pegmatites in Luobei [county, Hegang Prefecture, Heilongjiang province] and metallogenetic regularity of rare metals. Geology and Exploration (地质与勘探), V 29, no. 6, p. 8-12 (in Chinese with two sentence English abstract). p. 9 pegmatite geologic map, no scale bar, no culture, place names on map. The pegmatites in Proterozoic rocks are located 12 to 20 km north to due northnortheast of Luobei city. Three east flowing rivers are on the map.


LU, Huanzhang and WANG, Zhonggang. 1993. Mineralization, fluid and melt inclusion studies on No. 3 pegmatite of Keketuohai, Xinjiang, China. Abstract in GAC-MAC annual meeting proceeding, Canada (in English).


LU, Xinxiang; ZHU, Zhaohui; GU, Demin; ZHANG, Huamian; WU Mei; and WU, Yan. 2010. East Qinling granite pegmatite rock geological mineralization characteristics. [J]. Geological Review, V 56, No. 1, p. 21-30 (in Chinese with English abstract). Lots of maps which are the same as in an earlier publication but the individual pegmatite maps are new, no scale bars. An important paper. This paper contains geologic maps, without a scale bar of two individual pegmatites at Guanpo (no, 1 and 3), that contain pollucite zones.


LUAN, Shiwei (栾世伟); MAO, Yuyuan (毛玉元), FAN, Liangming (范良明), WU Xiaobing; and LIN, Jinhui. 1995. Rare Metal Mineralization and Exploration in the Keketuohai Area. Chengdu: Chengdu University of Science and Technology Press, p. 174-196 (in Chinese with English abstract).

LUAN, Shiwei (栾世伟); MAO, Yuyuan (毛玉元), FAN, Liangming (范良明), WU Xiaobing; and LIN, Jinhui. 1996. Rare Metal Mineralization and Exploration in the Keketuohai Area. Chengdu: Press of Chengdu University of Science and Technology, 278 p. (in Chinese with English abstract). Hardcopy. This is the second most famous book on the Keketuohai no. 3 pegmatite, especially written and published for the Beijing 1996 international geologic congress held there. The first most important book was by WANG, et al. (1981). Several other mineral and geology books were published for this meeting including the field trip to Keketuohai No. 3 which ended up with Gene Foord and others under hotel arrest for a short time. This book has the best pegmatite map, but no scale bar, page 134. This book also has an abundance of pegmatite district maps, geologic maps and other pegmatite cross sections.


NI, Yunxiang; and HUGHES, John M. 1996. The crystal structure of nanpingite-2M2, the Cs end-member of muscovite. American Mineralogist, V 81, p. 105-110 (in English).


NI Yúnxiáng (倪云祥); YANG, Yuèqīng (杨岳清); GUO, Lìhè (郭立鹤); ZOU, Tiānrén (邹天人); and LIN, Yuèyīng (林月英). 1989. The triphylite - lithiophilite series minerals in China [J]. *Acta Petrologica et Minerallogica*, V 8, no. 2, p. 144 – 155 (in Chinese with English abstract). Only 6 localities known at this time in China; 4 in the Xinjiang province districts, Nanping pegmatite district, Fujian, and the Shanxian pegmatite, Shanxi;

NIE, Xiaoliang; YI, Wenping; and LI, Mu. 2014. Geological Characteristics and Metallogenic Model of Heyuan Spodumene Deposit, South Jiangxi Province. *Advances in Geosciences (Earth Science Frontier)*, V 4, No. 1, p. 44-50 (In Chinese with English abstract). Article contains one geologic location map, a detailed pegmatite field map and a great pegmatite cross section.


QU, Gang (曲刚). 2007. Mineralogy of Yunnan Emerald and Research directions. [D]; *China University of Geosciences* (Beijing); 2007

QU, Min; GUO, Jinghui; LAI, Yong; PENG, Peng; and LIU, Fu. 2012. Origin and geological significance of the 1.81 Ga hyalophane-rich pegmatite veins from the high-pressure granulite terrain in the Central Zone of the North China Craton. *Earth Sciences in China*, v. 55, no. 2 (February), p. 193-203 (in English).

RAO, Can; Hatert, F.; WANG, Rucheng; GU, XP; BO, F. Dal; and Dong, CW. 2015. Minjiangite, BaBe$_2$(PO$_4$)$_2$, a new mineral from the Nanping No. 31 pegmatite, Fujian Province, southeastern China. *Mineralogical Magazine*, v 75, no. 5, p. 1195-1202.

RAO Can; WANG Rucheng; and HU, Huan. 2009. Electron-Microprobe Compositions and Genesis of Beryls from the Nanping No.31 Granitic Pegmatite (Fujian Province, Southeastern China) [J]; (高校地質學報) *Geological Journal of China Universities*; V 15, no. 4, p. 496-505.


RAO, Can; WANG, Rucheng; HU, Huan; and ZHANG, Wenlan. 2009. Complex Internal Textures in Oxide Minerals from the Nanping No. 31 Dyke of Granitic Pegmatite, Fujian Province, Southeastern China. *Canadian Mineralogist*, October 2009, vol. 47 no. 5, 1195-1212. (in English). P. 1197, a geologic map of Nanping No. 31 pegmatite with scale bar, place name locations of Nanping and the village of Xiyuantou. p. 1198 has a cross section.

RAO, Can; WANG, Rucheng; ZHANG, Aicheng; and HU, Huan. 2012. The courundum + tourmaline nodules related to hydrothermal alteration of spodumene in the Nanping No. 31 Pegmatite Dyke, Fujian Province, Southeastern China. *Canadian Mineralogist*, v. 50, 1623-1635. (in English).

RAO, Can; WANG, Rucheng; HATERT, Frederic; and BAIJOT, Maxime. 2014. Hydrothermal transformations of triphylite from the Nanping No. 31 pegmatite dyke, Southeastern China. *European Journal of Mineralology* (in English), v. 26, p. 179-188.

RAO, Can; WANG, Rucheng; HATERT, Frederic; GU, Xianping; OTTOLINI, Luisa; HU, Huan; DONG, Chuanwan; BO, Fabrice Dal; and BAIJOT, Maxime. 2014. Strontiohurlbutite, SrBe$_2$(PO$_4$)$_2$, a new mineral from Nanping No. 31 pegmatite, Fujian Province, Southeastern China. *American Mineralogist* (in English), v. 99, p. 494-499.


SHEN, Zhijun (申志军); XIE, Linglin (谢玲琳); QUAN, Zhengyu (权正钰). 2003. 湖南省主要稀有稀土金属矿床特征 Characteristics of the main rare-metal and rare-element deposits in Hunan Province. Hunan Geology journal, V 22, no. 1, p. 30-33, 63 (in Chinese with three sentence English abstract). Describes pegmatites at Chuanzhiyuan mine area, Pingjiang county, Hunan. p. 31 has a pegmatite zoning map but no scale bar, no culture. Lists by names 8 deposits, has sketches of 3.


Solodov, N. A. 1962. Internal Structure and Geochemistry of Rare-Element Granitic Pegmatites. Academy of Science, Moscow, USSR (in Russian). Book. Contains the cross section and map of the Keketuohai No. 3 pegmatite which was first called the Mongolian Altai No. 3 pegmatite.


SU, Xiǎofēn; ZHANG, Zhìguì; and ZHOU, Kāicàn. 2009. Cassiterite characteristics, mineralization, and paragenesis from Pingwu[, Sichuan Province]. 《中国非金属矿工业导刊》China Non-metallic Minerals Industry Herald, 2009年第04期


SUN, Kexiang; CHEN, Yongan; DENG, Baiqiong; and GAO, Ziying. 1986. Distribution of gems and their prospects in Yunnan Province: 1984-1986. Institute of Geology, Yunnan Province, 115 pp. (in Chinese). The book in my possession is a photocopy of the original book. The original contained color pictures. A few were missing/torn out from original. Lots of crystal cavity cross sections and pegmatite cross sections. A fold-out geologic map with scale bar, coordinates and localities, 1 cm = 2 km (p. 39).


TANG, Yong; ZHANG, Hui. 2015. Lanthanide tetrads in normalized rare element patterns of zircons from the Koktokay No. 3 granitic pegmatite, Altay, NW China. American Mineralogist, v 100, p. 2630-2636 [in English].

TANG, Yong; ZHANG, Hui; and SU, Guizhen. 2013. Phosphorus in alkali feldspars as an indicator for prospecting for pegmatite-type rare-metal ore deposits in Altay, NW China. Geochemistry: Exploration, Environment, Analysis, v. 13, p. 3-10. (in English).

TANG, Yong; ZHANG, Hui; LIU, Wenzheng; LÜ, Zhenghang; CHEN, Yang; and LIU, Yunlong. (in review 2015). Precise zircon U-Pb and molybdenite Re-Os dating of the Askaetor Be deposit in Altay, NW China. Probably submitted to Canadian Mineralogist.


TIAN, Ye; QIN, Kezhang; ZHOU, Qifeng; and Paterson, Greig. 2015. Structural control on the shape of intrusions in the Koktokay ore district, Chinese Altai, north western China. Journal of Structural Geology, pre-publication copy (In English).


VLASOV, K. A. 1952. Textural-paragenetic Classification of Granitic Pegmatites. Izvestiya ANSSSR, Geological Series No. 2 (in Russian). This is the earliest publication that is reported to have described the Keketuohai No. 3 pegmatite.


WANG, Denghong (王登红); CHEN, Yuchuan (陈毓川); and XI, Zhigang (徐志刚). 2003. Ar40/Ar39 Isotope dating on muscovites from Indosinian rare metal (pegmatite) deposits in Central Altay, northwestern China (矿物岩地球化学通报), Bulletin of Mineralogy, Petrology and Geochemistry, v. 22, No. 1, p. 14-17 (in Chinese with English abstract, bilingual references list).


WANG, Denghong (王登红); WANG, Ruijiang; LI, Jiankang; ZHANG, Zhi; YU, Yang; DAI, Jingjing; CHEN, Zhenhui; LI, Dexian; QU, Wenjun; DENG, Maochun; FU, Xiaofang; SUN, Yan; and ZHEN, Guodong. 2013. The progress in the strategic research and survey of rare earth, rare metal and rare-scattered elements mineral resources. Geology in China, v 40, no. 2, p. 361-370 (in Chinese with English abstract). Contains a picture of the lake in the Jiajika pegmatite field and a map showing the other pegmatite and non-pegmatite rare metal and REE deposits in Sichuan province.

WANG, Denghong; LI, Jiankang; and FU, Xiaofang. 2005. 40Ar/39Ar Dating for the Jiajika pegmatite-type Rare Metal Deposit in Western Sichuan and its Significance. Geochimica [Diqiu Huaxue] V 34, no. 6, 541-547 (in Chinese with English abstract). Contains geologic map of district with scale bar, no culture or coordinates.

WANG, Denghong; XI, Zhigang; ZOU, Tianren, CHEN, Yuchuan, and WANG, Longsheng. 2003. Major types and regional metallogeny of rare metal deposits in the Altay mountains, Xinjiang (in English). In: MAO, Jinwen; Goldfarb, RJ, Seltmann, R.; WANG, Denghong; XIAO,


Wang, Lianxun; Ma, Changqian, Zhang, Chao, and Mark, Michael A. 2014. Genesis of leucogranite by prolonged fractional crystallization: A case study of the Mufushan complex, [Hunan province], South China. Lithos, October, p. 147-163 [in English].


WANG, Rucheng; CHE, Xudong; ZHANG, Wenlan, ZHANG, Aicheng and ZHANG, Hui. 2009. Geochemical evolution and late re-equilibration of Na-Cs-rich beryl from the Koktokay 3 pegmatite (Altai, NW China). European Journal of Mineralogy, V 21, p. 795-809 (in English).

Standard Keketuohai No. 3 index map with standard generalized pegmatite cross section but with a scale bar.


WANG Rucheng; HU, Huan; ZHANG, Aicheng; FONTAN, Francis; ZHANG, Hui; and Philippe De PARSEVAL. 2006. Occurrence and late re-equilibration of pollucite from the Koktokay 3 pegmatite, Altai, Northwestern China. American Mineralogist. V 91, No. 5-6, p. 729-739 (in English).


WANG, Rucheng; FONTAN, Francois; XU, Shijin; CHEN, Xiaoming and MONCHOUX, Pierre. 1997. The association of columbite, tantalite and tapiolite in the Suzhou granite, China. Canadian Mineralogist, V 35, p. 699-706 (in English). See Wang et al. 1996 for the geologic basemap that can be converted into a real map for describing these pegmatites in granite.

WANG, Rucheng; FONTAN, Francois; XU, Shijin; CHEN, Xiaoming; and MONCHOUX, Pierre. 1996. Hafnian zircon from the apical part of the Suzhou granite, China. Canadian Mineralogist, V 34, p. 1001-1010 (in English). Contains the geologic basemap that can be converted into a real map for describing these pegmatites in granite.

WANG, Rucheng; ZHAO, Guangtao; WANG, Dezi; LU, Jianjun and XU, Shijin. 2000. Differentiation and accumulation of fluids in A-type granites: Evidence from accessory mineral study. *Chinese Science Bulletin*, V. 45, No. 17, p. 1609-1613 (in English). States green arvedsonite crystals to 3 cm are found in the miarolitic cavities, in the roof pegmatitic facies of the A-type granite, named Laoshan Granite, Qingdao, Shandong province. This granite might become a future source of rare microminerals of sphene, aegirine, zircon, fergusonite, ilmenite, pyrochlore, manganocolumbite, and xenotime. No maps.


WANG, Tao; TONG, Ying; Jahn, Borming; ZOU, Tianren; WANG, Yanbin; HONG, Dawei and HAN, Baofu. 2007. SHRIMP U–Pb Zircon geochronology of the Altai No. 3 Pegmatite, NW China, and its implications for the origin and tectonic setting of the pegmatite. In: Ore Geology Reviews, Volume 32, Issues 1-2, September 2007, p. 325-336 (in English). Contains redrawn geologic maps with latitude and longitude and a scale bar on the detailed maps.

WANG, Tao; HONG, Dawei; JAHN, Borming; TONG, Ying; WANG, Yanbin; HAN, Baofu; and WANG, Xiaoxia. 2006. Timing, petrogenesis and setting of Paleozoic synorogenic intrusions from the Altai Mountains, northwest China: Implications for the tectonic evolution of an accretionary orogen. Journal of Geology, v. 114, p. 735-751.


WANG Wenying; YANG, Yueqing; CHEN, Chenghu; and ZHU, Jinghuang. 1999. Study on the Nb and Ta-minerals from the Granitic Pegmatites in Nanping, Fujian Province; Geology of Fujian, v. 20, no. 3., p. 113-133 (in Chinese with English abstract). No maps, sketch of a wodginite crystal.


WANG, Xianjue, ZOU, Tianren, XU, Jianguo; YU, Xueyuan, and QIU, Yuzhuo. 1981. The Study of pegmatite minerals from the Altai Region. Science Press, Beijing, 140 p. (in Chinese). This is the first classic book-length report on the geology and mineralogy of the Keketuohai No. 3 pegmatite. The cross section map without scale is on page 5 but is not the best in print cross section. The best are in either Luan, et al. (1996), p. 134 or Zou, et al. (1986), p. 35. The extensive mineralogy of these pegmatites is superbly done in this book.

WANG, Yong; LU Qingtian; MENG Guixiang; YAN Jianyong; YANG Yueqing; and ZHAO Jinhua. 2009. Alkali Feldspar Granite of Dongqiyishan, Inner Mongolia and Its Metallogenesis [J]; Acta Geologica Sinica; No. 10


WU, Changnian; ZHU, Jinchu; LIU, Changshi; YANG, Shenzu; ZHU, Bingyu; and NING, Guangjin. 1994. A Study on the inclusions in spodumenes from Altai pegmatites, Xinjiang. Geotectonica Et Metallogenia, V 18, No. 4, p. 351-361 (in Chinese). Mentions the Keketuohai No 3 pegmatite, the Qinghe County No. 92 pegmatite and the Kelumute No. 112 pegmatite.


XU, Cheng; HUANG, Zhilong; QI, Liang; XIAO, Huayun, LI, Wenbo; and LIU, Congqiang. 2001. Source and evolution of ore-forming fluids of Maoniuping Rare-earth deposit – evidence


XU, Meihui (许美辉). 1997. Basic characteristics of the shell source (壳源型= keyuanxing) miarolitic granite, Sha (Sandy) county, Fujian Province. *Geology of Fujian*, V 16, No. 2, p. 51 -60. Discusses the granite of Yunxiao County which produces spessartite and smoky specimens. P. 52 has areal geologic map, scale bar, and two towns on map in Sha County.

XU Tóngtài (付同泰); CHEN, Jiālín (冯家麟); BING, Lifū (邴力夫); DUAN, Ruiyán (段瑞炎); and YU, Zhīhóng (于志鸿). 1984. Genetic types and distribution of Qinling segment of rare metal pegmatites. *秦岭东段稀有金属花岗伟晶岩的成因类型及其分布规律* (1964), p. 31-32


YAN, Chen; XU, Quancheng; ZHANG, Haijun; WEI, Renmou; WANG, Yali; ZHANG, Dinghua; ZHU, Anqi; HUANG, Yunyu; SUN, Jiaqi; and LI, Junmin. 1985. *The Granites of Shaanxi Province*. Jiaotong University Press, Xi’an, Sha’anxi Province, 321 p. (in Chinese with an English Introduction and table of contents). Book has several excellent geologic maps of all the granite bodies with coordinates and place names.


YAN, Yunxiu and YE, Xusun. 1983. A preliminary study on the origin and metallogenetic characteristics of Mesozoic granites in Guangxi, China. Geochemistry, v 2, no. 3, p. [in English].


YANG, Hanchen; YI, Xianrui; YI, Shuangting; SONG, Jianzhong; and MIN, Yaoming. 1986. Xinjiang’s Gems and Jades. Xinjiang People’s Publishing House, Urumqi, Xinjiang. 164 p (in English). Book is English translation of Chinese original publication. Abundant color pictures of polished rocks and colored gemstones. Excellent reference.


YANG, Yueqing; GUO Yunquan; CHOU Nianming; CHEN, Chenghu; and CAI, Ghaofa. 1988. The REE Geochemistry of the Nanping Granitic Pegmatite Ore Fields in Fujian Province. Chinese Academy of Geological Sciences, Institute of Geological Collected Works.


YANG, Yueqing, NI, Yunxiang, GUO, Yongquan, QIU, Nianming, CHEN, Chenghu, CAI, Chaofa, ZHANG, Yaping, LIU, Jiabing; CHEN, Yuexian; and Zhang Yaping. 1988. Petrogenetic and Metallogenetic characteristics of the Xikeng Granitic pegmatites, Fujian Province. [J]
YANG, Yueqing, NI, Yunxiang; GUO, Yongquan; QIU, Nianming; CHEN, Chenghu; CAI, Chaofa; ZHANG, Yaping; LIU, Jiabing; CHEN, Yuexian; and Zhang Yaping. 1987. Rock-Forming and Ore-Forming Characteristics of the Xikeng Granitic Pegmatites in Fujian Province [J]; Mineral Deposits; V 6, No. 3, p. 10-21. (in Chinese with English Abstract). p. 11 best geologic map of district, no scale, one place name, p. 12 only geologic map of No. 31 pegmatite, most complex in field with scale bar, from an underground mine, p. 14, geologic cross section of the pegmatite with scale bar.

YANG, Yueqing (杨岳清); WANG, Wenying (王文瑛); CHEN, Chenghu (陈成湖); and ZHU, Jinghuang (朱锦煌). 2006. Study on the cassiterite from the Granitic pegmatites in Nanping, Fujian Province [J]; Geology of Fujian; V 25, no. 2., p. 75-81 (in Chinese with English abstract). No maps.


YANG, Yueqing; WANG, Wenying; NI, Yunxiang; CHEN, Chenghu; and ZHU, Jinhuang. 1997. Study on the Micas in Granitic Pegmatite and Their Wall Rocks in Nanping, Fujian Province [J]; Geology of Fujian; 1997-02


YANG, Yueqing; WANG Wenying; Ni Yunxiang; Chen Chenghu; and ZHU, Jinghuang. 1995. A Study on Montebrasite in the Nanping Granitic Pegmatite [J]; Geology of Fujian; 1995-01


YIN, Rong; WANG, Rucheng; ZHANG, Aicheng; HU, Huan; ZHU, Jinchu; RAO, Can; and ZHANG, Hui. 2013. Extreme fractionation from zircon to hafnon in the Koktokay no. 1 pegmatite, *American Mineralogist*, v. 98, p. 1714-1724 (In English).

YIN, Rong; WANG, Rucheng; ZHANG, Aicheng; HU, Huan; ZHU, Jinchu; RAO, Can; and ZHANG, Hui. 2015. Chemical evolution and late-stage re-equilibration of Zr-Hf-U-bearing columbite group minerals in the Koktokay No. 1 granitic pegmatite, altai, northwestern China. *Canadian Mineralogist*, v. 53, p. 461-478 (In English).


ZHANG, Aicheng; WANG, Rucheng; LI, Yiliang; HU, Huan; LU, Xiancai; JI, Junfeng; and ZHANG, Hui. 2008. Tourmalines from the Koktokay No.3 pegmatite, Altai, NW China: spectroscopic characterization and relationships with the pegmatite evolution. *European Journal of Mineralogy*, V 20, No 1, February 2008, p. 143-154 (in English). Generalized geologic cross section of Keketuohai No. 3 pegmatite.
ZHANG, Aichang; WANG, Rucheng; HU, Huan; and ZHANG, Hui. 2004. Occurrences of foitite and rossmanite from the Koktokay No.3 granitic pegmatite dyke, NW China: A record of hydrothermal fluids. Canadian Mineralogist, 42, 873-882 (in English).

ZHANG Aichang; WANG Rucheng; Hu, Huan; ZHANG, Hui; ZHU, Jinchu; and CHEN, X M. 2004. Chemical evolution of Nb-Ta oxides and Hf-rich zircon from the Koktokay No.3 granitic pegmatite, Altai, Northwestern China. Mineralogical Magazine, V 68, no. 5, p. 739-756. (in English).


ZHANG, Enshi; ZHANG, Wenhuai; and LIU, Wei. 1987. On the Formation Mechanism of Keketuohai Pegmatite, Xinjing, China [J]; 1987-04


ZHANG, Hui, and LIU, Congqiang. 2001b. Sr/Eu ratio in apatites as a recorder of fluid exsolution from pegmatite-forming melt. (Abstract only) Eleventh Annual V. M. Goldschmidt Conference, paper 3314 (In English). This abstract discussed the summary of the previous paper above.
ZHANG, Jinfu (张金富); ZHOU, Cunhui (周存会); and HU, Changshou (胡长寿). 2003. Gemstone mineralization and structural features of the Ailaoshan trend, Yunnan Province. 《云南哀牢山构造带的宝石成矿特征. Gems and Gemology (宝石和宝石学杂志), v 5, no. 3, p. 27-30 (In Chinese).}


ZHANG, Peishan; YANG, Zhuming; TAO, Kejie; and YANG, Xueming.1996. Mineralogy and Geology of Rare Earths in China. Science Press (Beijing), pp. 226. Only discusses Keketuohai No. 3 pegmatite.


ZHANG, Rubai; HAN, Fengming; and DU, Chongliang. 1985. Ertixiite - A New Mineral from an Altay Pegmatite Mine, Xinjiang, China. Chinese Journal of Geochemistry, V 4, no. 2, p. 192-195 (in English). No maps. The four included references are citations of other rare minerals from the Altay region.


ZHANG, Rubai; ZHANG, Yuyu; and GONG, Xiasheng. 2005. $\text{Fe}^{3+}_2\text{Sn}_3\text{O}_9$, an unnamed mineral of the Kyzylkumite group. Journal of Mineralogy and Petrology, V 26, No. 2, p. 11-14.

ZHANG, Rubai (张如柏); ZHOU, Ruibo (周瑞波); DU, Longliang (杜崇良) and WANG, Siying (王思映). 1991. Chrysoberyl found at Danba [Sichuan Province]. [J], No. 4, p. 319-320 (in Chinese).

ZHANG, Shitao; FENG, Minggang; Hu, Rongrong; DU, Chen; and ZHANG, Yahu (张世涛, 冯明刚, 胡荣荣, 杜晨, 张亚辉). 2011. The Malipo emerald geological features and the sustainable use of research. The Mineral Journal, 2011-S1

ZHANG, Shitao, FENG, Minggang; WANG, Houqiang, LU, Wei, and YANG, Ming. 1999. Geological features and the genesis of Emerald deposit in Malipo County, Yunnan Province, China. Geological Science and Technology Information, V. 18, no. 1, p. 30 -54.


ZHANG, Yuyu (张玉玉) and ZHANG, Rubai (张如柏). 2008. The Discovery of Spodumene in Petalite Pegmatite, Tongcheng [county, Xianning Prefecture], Hubei [province], *China Journal of Mineralogy and Petrology* (礦物岩石), V 28, no. 3, p. 37-40. Also numerous census reports in the China Geological Archives- about the Huanglong Mai Wo area pegmatites, Mai Wo community, Tongcheng county. No maps.

ZHANG, Zhilan. 1984. The discovery of a six-layered Cs-rich lepidolite in Qinling Mountain pegmatites. Published by the Chengdu College of Geology, Chengdu, Sichuan province (available from HowNet).

ZHANG, Zhilan; ZHANG, Rubai; and TIAN, Huixin. 1979. Alteration of Spodumene in the rare-metal granite-pegmatites of the Qinling Mountains in a district. *Chengdu University of Technology (Natural Science)*, No. 4, p. 27-44 (in Chinese). No maps.


ZHAO, Xianjun (赵献军); YAN, Changjiang (殷长江); WANG, Fang (王芳); TIAN, Jiangtao (田江涛); QU, Fengying (曲凤英); and GU, Jindian (贾金典). 2012. The characteristics and formation of the Jingerquan (Jinger Springs) spodumene pegmatite deposit, Hami Prefecture, Xinjiang Province. [J] China Science and Technology Review, V 22, No. 2, p. 277-278. (in Chinese).


ZHAO, Yuxiang; ZHAO, Guangming; and ZENG, Yifu. 2015. Geological Features and Genetic Model for the Granitic Pegmatite Type (Jiajika Type) Li Deposits in West Sichuan Province - By the Example of the Jiajika Li Deposit. Acta Geologica Sichuan (四川地质学报), V 35, no. 3, p. 391-395 (in Chinese).


ZHONG, Liangjun and TIAN, Zhao. 1990. Selection of a Quarry Mining Program for the Maerkang Spodumene Deposit, Maerkang County, Aba Prefecture, Sichuan. Xinjiang Non-Ferrous Metals, No. 2, p. 43- 48 (in Chinese). Contains sketch maps of the underground tunnels used to extract the spodumene. Also contains description of the pegmatite dimensions, the mine area and its local environment without actually stating where it is. Evidence that this mine has been around for at least 20 years.


ZHOU, Kaichan; LI, Qiang; XIANG, Changjiin; FENG, Qiming; WAN, Jishan; and HAO, Qin. 2002. Scheelite, Cassiterite and Beryl from Pingwu, Sichuan Province [J]; *Journal of Gems & Gemology*, No. 1 (in Chinese).


ZHU, Jinchu; WU, Changnian; CHEN, Peirong, YANG, Shenzu; and ZHU, Bingyu. 1996. Magmatic-hydrothermal evolution and genesis of Koktokay no. 3 rare metal pegmatite dyke, Altai, China. *Proceedings of the 30th IGC* (abstract in English).


ZHU, Jinchu; RAO, Bing; XIONG, Xiaolin; LI. Fuchun; and ZHANG, Peihua. 2002. Comparison and genetic interpretation of Li-F rich, rare-metal bearing granitic rocks [J]; *Geochimica*; V 31, No. 2, p. 141-152.


pegmatites in the Altai region, extensive color and black & white photographs of minerals – colored tourmalines, tantalites, spodumene, beryls, apatite, feldspars and others. Extensive bibliography of Chinese references. Far superior to all the other publications but supplements previous reports.


ZOU, Tianren; YANG, Yueqing; CAO, Huizhi; (曹惠志); YU, Wenzhao (余文昭); YAO, Yutang (姚玉堂); LI, Yifu (李义甫); and SUN, Zhongliang (孙忠良). 1986. The composition and mineralization characteristics of the No. 112 pegmatite, Xinjiang Province as a result of studies done in 1980. The anthology collection from the Institute of Geology, Chinese Academy of Geological Sciences. No. 2, p. 79-80.


ZOU, Tianren; YANG, Yueqing; GUO, Yongquan and NI, Yunxiang. 1985b. China’s Crust- and Mantle-sourced pegmatites and their discriminating Criteria. Geochemistry, Beijing, No. 4, p. 1-17 (in English).


ZOU, Tianren; ZHANG, Xiangchen; JIA, Fuyi; WANG, Ruchong; CAO, Huizhi; and WU, Poqing. 1986. The Origin of the No.3 pegmatite in Altay[ Xinjiang Province]. Mineral Deposits, V 5, no. 4, p. 34-48 (in Chinese with English abstract). The title has also been reported as “A discussion about contributing factor of the Altai No. 3 pegmatite. Excellent horizontal and vertical geologic cross sections of the No. 3 pegmatite. No scale bars for either cross section.


ZUEN, Dong; ZHANG, Pengxiang; and ZHANG, Yan. 1999. Raman measurements of inclusion in Yunnan emerald. [J]; Journal of Light Scattering; No.3.