



礦物珍品

MINERAL TREASURES

中國地質博物館

郭克毅 周正 著

THE GEOLOGICAL MUSEUM OF CHINA

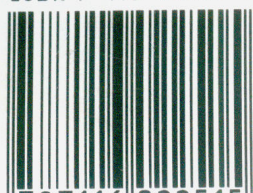
Guo Keyi Zhou Zheng

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前言

礦物是地殼中由地質作用形成的固態晶質自然元素單質及其化合物。礦物組成了岩石和礦石，構成了五彩繽紛的大自然，為人類提供了生存的必要條件。源遠流長的礦物文化，是人類在礦物世界不斷探索的智慧結晶。

中國地質博物館具有80年的地質標本收藏歷史，館內藏品豐富，種類齊全，規模堪稱亞洲之最。至今已有礦物藏品一萬多件，礦物種達一千餘種，其中不少是極為珍貴的藏品。1980年，為了參與在第26屆國際地質大會上的交流，本館曾編製出版了《中國礦物》圖集，受到國內外讀者的好評與歡迎。為了迎接第30屆國際地質大會在北京召開；為了向廣大讀者介紹我館珍貴的礦物藏品和普及礦物知識；也為了滿足中外礦物愛好者的鑒賞需要并為教學科研提供參考，作者在本館領導的支持與幫助下，編撰了這本《礦物珍品》，謹以此獻給第30屆國際地質大會及國內外鍾情礦物的各界讀者；同時也作為一件禮物慶賀中國地質博物館建館80周年。

《礦物珍品》是以中國地質博物館館藏標本為基礎，以國內部份省市有關單位及奇石收藏家的礦物珍品作補充，經認真研究和精心攝影后，選擇其中200餘種礦物的照片400餘幅，採用中英對照的介紹方式，根據當前通用的礦物分類方法按系統編撰成冊。該書重點突出了辰砂、輝銻礦、藍銅礦、雌黃、雄黃、黑鎢礦、白鎢礦和錫石等中國的優勢礦物；介紹了香花石等珍貴的中國新礦物、橙汞礦與紅鉍礦等自然界的稀少礦物、髮狀赤銅礦與雙錐狀魚眼石等罕見礦物形態；也展示了館藏的部份外國礦物精品。

本書的順利出版，得到了各級領導的支持、幫助和有關單位及同行的大力協助與指導。國家計委第30屆國際地質大會科研項目管理辦公室和地礦部地質行業基金委員會在經費上給予鼎力資助；成都理工學院、長春地質學院、南京大學、昆明地質學校、江蘇地礦局博物館、山東地礦局博物館、大連自然博物館、遼寧瓦房店金剛石總公司、遼寧第六地質大隊及鄧天人、劉水、郁增啟、胡國忠、龔光中、蕭永福、陳代演、張聖發等單位和個人提供了礦物標本；陳安澤是編寫本書的最早策劃者，因工作調動未能參加具體工作；李瑞鳳、朱習剛、王炳熙、尹繼才和謝蘋等同志給予多方面的支持與幫助；郭宗山、黃蘊慧、陳代璋、程利偉和王炳熙對本書作了最後審訂。在此，衷心向上述單位、領導、教授和同行們致以深切的謝意。本書由郭克毅負責攝影，周正承擔全書礦物標本的鑒定、研究，立論撰文，由劉乃隆和周正譯成英文。書中錯誤難免，歡迎批評指正。

FOREWORD

Minerals refer to solid crystalline native elements and their compounds in the Earth's crust formed through geological processes. They have composed rocks and ores, making up our colorful Nature and providing prerequisites for the existence of mankind. The long-standing and well-established mineral civilization is a crystallization of wisdom from the unceasing exploration in the mineral world by mankind.

The Geological Museum of China has an eighty-year history of geological specimen collecting, which, with a wealth and a wide variety of collection, may rank first in Asia with respect to its scale. It has up to now more than ten thousand pieces of mineral collection covering more than one thousand of mineral species, of which many are extremely precious. In 1980, for the sake of taking part in the exchange in the 26th International Geological Congress, the Museum has compiled and published an album, the Minerals of China, which was praised and welcomed by readers at home and abroad. And now, in order to greet the 30th International Geological Congress to be held in Beijing, to introduce the precious mineral collection of our Museum and to popularize the mineralogical knowledge to the broad masses of readers, and also to meet the need of appreciation of mineral-lovers at home and abroad and to offer reference materials for education and scientific research, the authors have compiled the present book Mineral Treasures under the support and help of the leadership of our Museum, which is to be dedicated to the 30th International Geological Congress and masses of readers at home and abroad who are interested in minerals, and to be taken as a gift to congratulate the 80th anniversary of the establishment of the Geological Museum of China.

The contents of the Mineral Treasures include mainly the collection of the Geological Museum of China, with a minor part provided by relevant organizations of some provinces, regions and municipalities and stone-collectors. The specimens were conscientiously studied and photoed, and over 400 photos of over 200 mineral species were selected, which were attached with Chinese and English explanations and arranged according to the current mineral classification scheme and compiled into the album. The book gives prominence to the preponderant minerals of China like cinnabar, stibnite, azurite, orpiment, realgar, wolframite, scheelite and cassiterite, introduces China's precious new minerals like hsianghualite, rare minerals in the Nature like montroydite and lorandite, rare mineral forms like hairlike cuprite and dipyramidal apophyllite, and also displays some foreign mineral treasures collected in our Museum.

The publication of this book was powerfully supported, guided and helped by leaderships of various levels, relevant organizations and colleagues. The Administration Office of Scientific Research Projects of 30th International Geological Congress, National Planning Committee and the Committee of Geological Profession Fund, Ministry of Geology and Mineral Resources have aided financially; Chengdu Institute of Technology, Changchun College of Geology, Nanjing University, Kunming School of Geology, Museum of Jiangsu Bureau of Geology and Mineral Resources, Museum of Shandong Bureau of Geology and Mineral Resources, Dalian Natural Museum, Wafangdian Diamond Corporation, Liaoning and the 6th Geological Party of Liaoning, and individuals like Zou Tianren, Liu Shui, Yu Zengqi, Hu Guozhong, Gong Guangzhong, Xiao Yongfu, Chen Daiyan and Zhang Shengfa have provided mineral specimens. Chen Anze, the earliest planner of the compilation of the book, has not been able to take part in the concrete work because of post transference. Li Ruifeng, Zhu Xigang, Wang Bingxi, Yin Jicai and Xie Ping have given supports and aids in various fields. Guo Zongshan (Kuo Tsung-shan), Huang Yunhui, Chen Daizhang, Cheng Liwei and Wang Bingxi have made final examination and revision for this book. The authors shall express their hearty thanks to the above organizations, leaderships, professors and colleagues. The photos in the book were all taken by Guo Keyi. All mineral specimens were identified, studied and explained by Zhou Zheng, and English translation was made by Liu Nailong and Zhou Zheng.

Any comment or criticism to this book is warmly welcomed.

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自然元素大類

自然元素礦物主要指在自然界中呈單質和金屬互化物產出的礦物。本大類礦物約佔地殼總重量的0.1%，分布極不均勻。組成元素主要有Ru、Rh、Pd、Os、Ir、Pt、Cu、Ag、Au、As、Sb、Bi、S和C。多數礦物的原子呈最緊密堆積，具金屬鍵，呈等軸狀和六方板狀晶形，具不透明、金屬光澤、反射率強、硬度低、密度大、延展性強等金屬特性，為電和熱的良導體。具共價鍵和分子鍵的礦物表現出明顯的非金屬性，除金剛石外，具硬度低、熔點低、導電和導熱性差等特點。本大類礦物成因多種，其中多數礦物的形成與基性、超基性岩漿作用和熱液作用有關，少數生成在氧化帶中。

NATIVE ELEMENTS

Native element minerals include the minerals occurring in nature as single elements or as intermetallic compounds. Minerals of this class make up about 0.1% by weight of the whole Earth's crust but are extremely unevenly distributed. The constituent elements are mainly Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, Au, As, Sb, Bi, S and C. Atoms of most minerals appear in the closest packing. They have metallic bonds and appear as isometric or hexagonal tabular crystal forms. Mostly opaque with metallic luster, high reflectance, low hardness, large density, strong ductility and malleability, being characteristic of metals and as good conductors of heat and electricity. Minerals with covalent bonds and molecular bonds exhibit evident non-metallic characters which, with the exception of diamond, are characterized by low hardness, low melting point and poor conductivity of heat and electricity. Minerals of this class are various in origin, but the formation of most of them is related to basic and ultrabasic magmatism and hydrothermalism, and minor ones occur in oxidized zone.



金剛石 Diamond C

等軸晶系。晶體多為八面體、菱形十二面體、立方體單形及它們的聚形，晶面上常有蝕像，接觸雙晶較普遍。無色透明，微量元素混入呈各種顏色。強金剛光澤， H 10， ρ 3.52 g/cm³，具強色散和良導熱性。熔點高，化學性質非常穩定。產於金伯利岩、鉀鎂煌斑岩及砂礦礦床中。

Isometric system. Crystals are mostly octahedra, rhombic dodecahedra, cubes and their combinations. There are often etching figures on crystal face, and contact twins are rather common. Colorless and transparent, but appears in various colors with the admixing of trace elements. Strong adamantine luster. H 10, ρ 3.52 g/cm³, with strong dispersion and good thermal conductivity. Melting point high, chemical property very stable. Occurs in kimberlite, lamproite and placer deposits.

2

3

1. 金剛石 產於金伯利岩中(d 1.5cm, 山東)
Diamond In kimberlite(d 1.5cm, Shandong, China)
2. 金剛石 晶面有倒三角蝕像(d 1cm, 遼寧)
Diamond Etching figure of inverse triangle on crystal face
(d 1cm, Liaoning, China)
3. 金剛石 八面體與菱形十二面體聚形(d 1.5cm, 遼寧)
Diamond Combination of octahedron with rhombic dodecahedron
(d 1.5cm, Liaoning, China)



金剛石 平行連晶(b 2cm, 遼寧)
Diamond Parallel group(b 2cm, Liaoning, China)



金剛石 接觸雙晶(d 0.45cm, 遼寧)
Diamond Contact twin(d 0.45cm, Liaoning, China)

金剛石 綠色(d 1cm, 湖南) Diamond Green(d 1cm, Hunan, China)





自然銅 樹枝狀(2cm, 安徽) Copper Dendritic(2cm, Anhui, China)



自然銅 八面體(d 1.2—1.5cm, 美國) Copper Octahedron(d 1.2—1.5cm, USA)

自然銅 Copper Cu

等軸晶系。完好晶體少見，常見樹枝狀、片狀、絲狀或塊狀集合體。銅紅色，表面常有褐色氧化膜，條痕銅紅色。金屬光澤，不透明， H 2.5—3， ρ 8.4—8.95 g/cm³，具延展性和良好的導電、導熱性。主要產於含銅硫化物礦床的氧化帶。

Isometric system. Perfect crystals are rare. Usually occurs as dendritic, lamellar, filamentous and massive aggregates. Copper-red in color, usually with brown oxidized membrane on surface, with copper-red streak and metallic luster. Opaque, H 2.5—3, ρ 8.4—8.95 g/cm³, with ductility, malleability and good electric and thermal conductivity. Occurs mostly in oxidized zone of cupriferous sulfide deposits.



自然銅 菱形十二面體(d 2cm, 美國)
Copper Rhombic dodecahedron(d 2cm, USA)

自然銅 不規則狀(12cm, 安徽) Copper Irregular shaped(12cm, Anhui, China)



自然銅 樹枝狀(21cm, 美國) Copper Dendritic(21cm, USA)



自然金 塊狀(3cm, 四川) Gold Massive(3cm, Sichuan, China)

自然金 Gold Au

等軸晶系。完好晶形少見，多呈粒狀、團塊狀、片狀或樹枝狀集合體形態。金黃色，條痕金黃色。金屬光澤，不透明。 $H\ 2-3$ ，純者 $\rho\ 19.30\text{ g/cm}^3$ 。具良好的延展性、導熱和導電性。化學性質穩定，不氧化，不溶於一般酸和鹼。主要產於蝕變岩、石英脈和砂礦中。

Isometric system. Perfect crystals are rare, mostly as granular, nodular, lamellar and dendritic aggregates. Gold-yellow in color, with gold-yellow colored streak and metallic luster. Opaque, $H\ 2-3$, ρ for pure variety 19.3 g/cm^3 , with good ductility and malleability, electric and thermal conductivity. Chemical property is stable, not oxidizable, insoluble in common acids and alkalis. Occurs mainly in altered rocks, hydrothermal quartz veins and placer deposits.



自然金 塊狀(4cm, 山東) Gold Massive(4cm, Shandong, China)

自然銀 Silver Ag

等軸晶系。少見完好晶形, 常呈網狀、樹枝狀、絲狀、粒狀或塊狀形態。銀白色, 氧化後表面呈灰黑色被膜, 條痕銀白色。金屬光澤, 不透明。 H 2.5 – 3, ρ 10.1 – 11.1 g/cm³。具延展性和良導電、導熱性。產於中低溫熱液礦床中及硫化礦床氧化帶。

Isometric system. Perfect crystals are rare. Usually as reticular, dendritic, filamentous, granular or massive forms. Silver-white in color, with grayish-black membrane on surface after oxidization. Silver-white colored streak and metallic luster. Opaque, H 2.5 – 3, ρ 10.1 – 11.1 g/cm³, with ductility and malleability and good electric and thermal conductivity. Occurs in meso-epithermal deposits and oxidized zone of sulfide deposits.

1. 自然銀 亂絲狀(6cm, 江西)
Silver Tangling filamentous(6cm, Jiangxi, China)
2. 自然銀 絲狀(最長銀絲 3cm, 河南)
Silver Filamentous(longest silver wire 3cm, Henan, China)

