



MORE DEADLY THAN AN H-BOMB TO SUPERMAN,
THE KRYPTONITE LODGES NEAR HIM!

LOSING
HIS SUPER-
STRENGTH,
HE'LL LET
HOUSING
CRASH! HE'LL
NEVER LIVE
IT DOWN...
HA, HA!

KRYPTONITE!
OH... GETTING
WEAK... (GASP!)





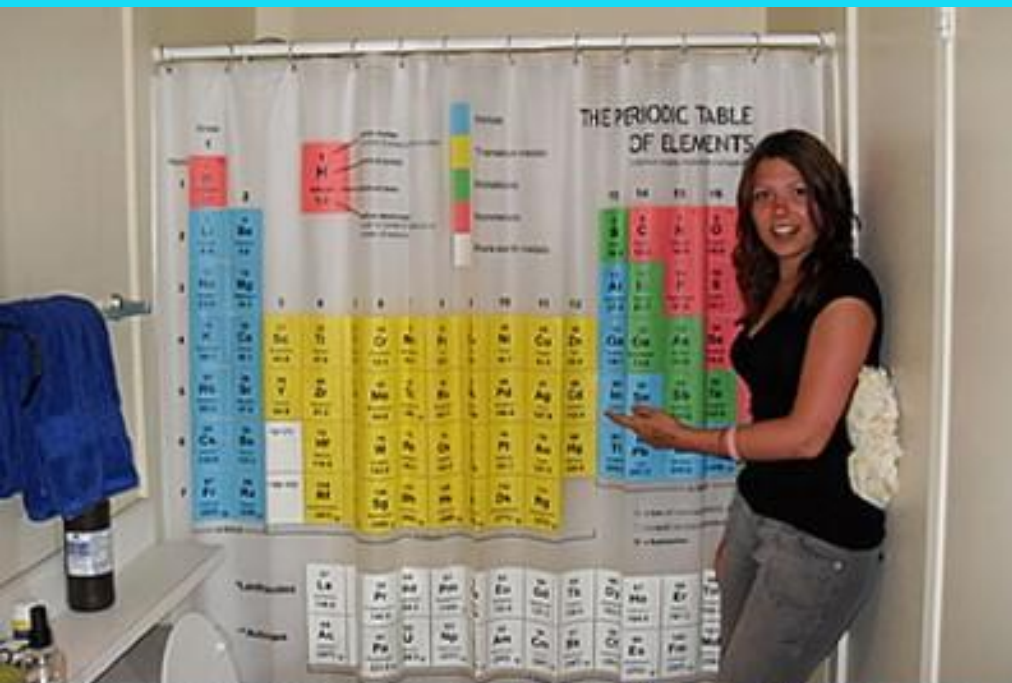


P – Do que são feitas as bebidas esportivas?

R – Os suplementos repositores hidroeletrólíticos são basicamente compostos por água, uma pequena taxa de carboidratos (que varia de 6% a 8%) e **minerais, como sódio e potássio**.

Eles possuem ainda sabores artificiais.

“Como têm os mesmos componentes do plasma do sangue, os isotônicos são adequados para restaurar a hidratação do corpo”, afirma Turibio Leite de Barros Neto (SP), especialista em fisiologia do exercício.

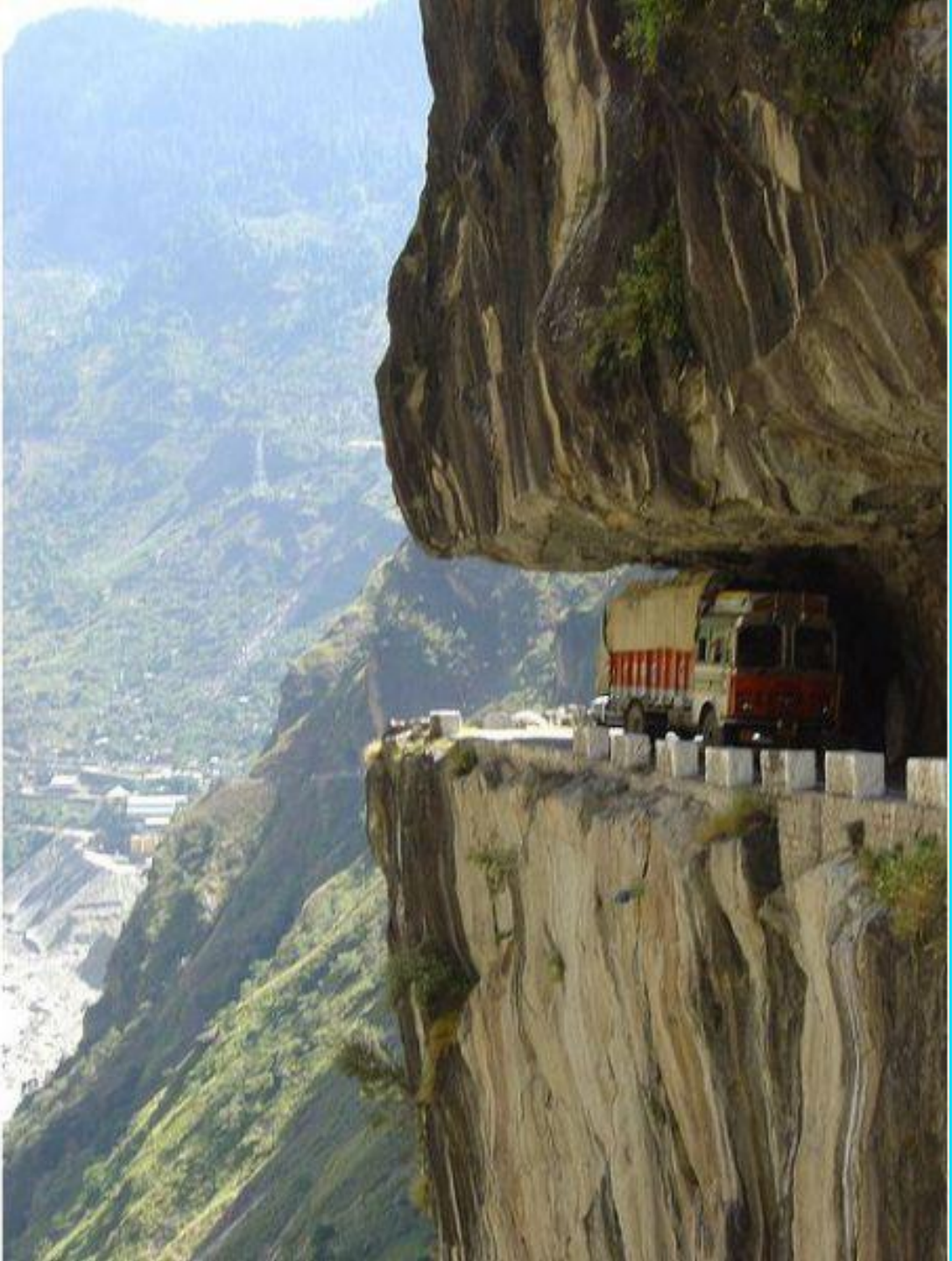






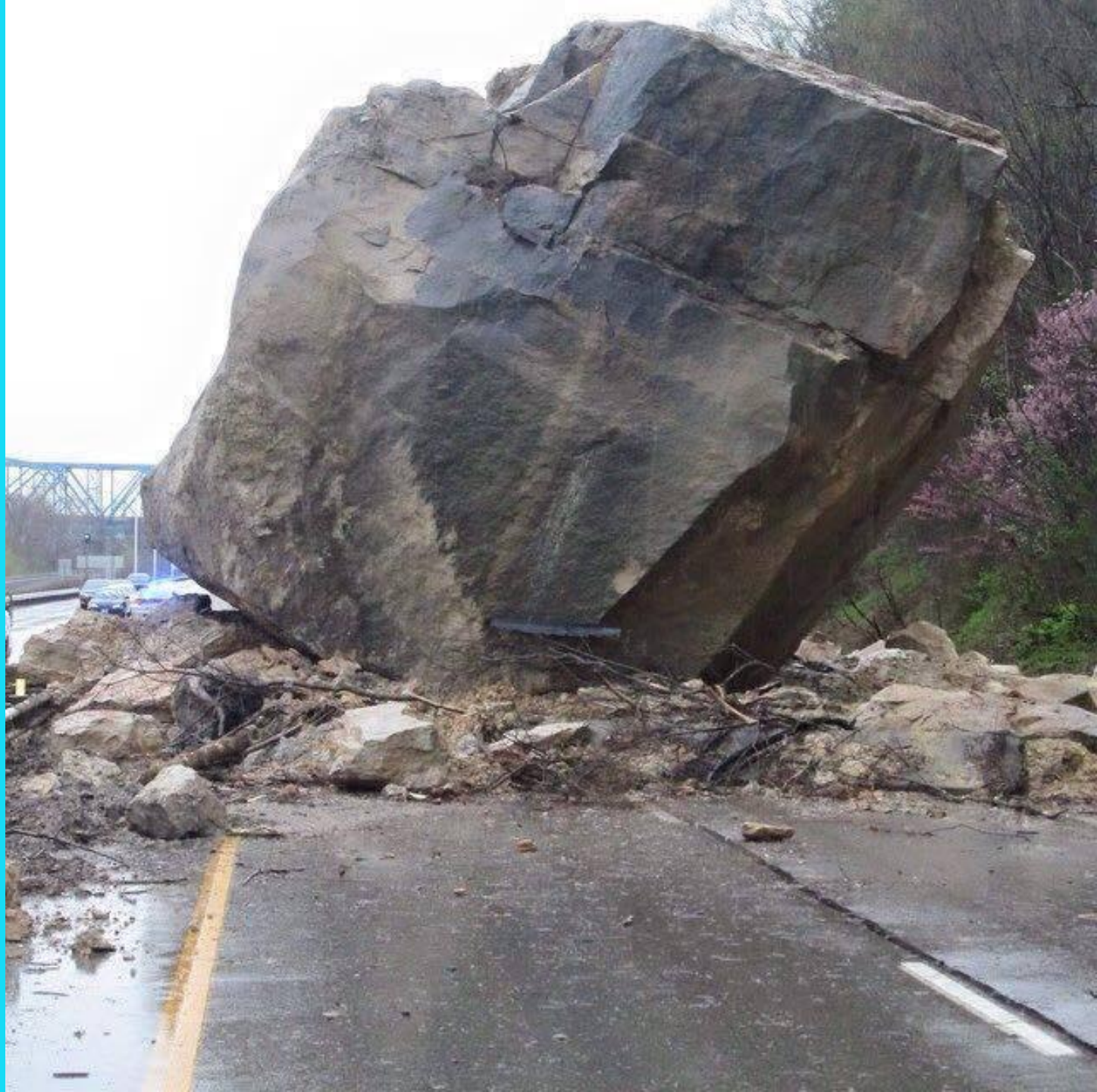




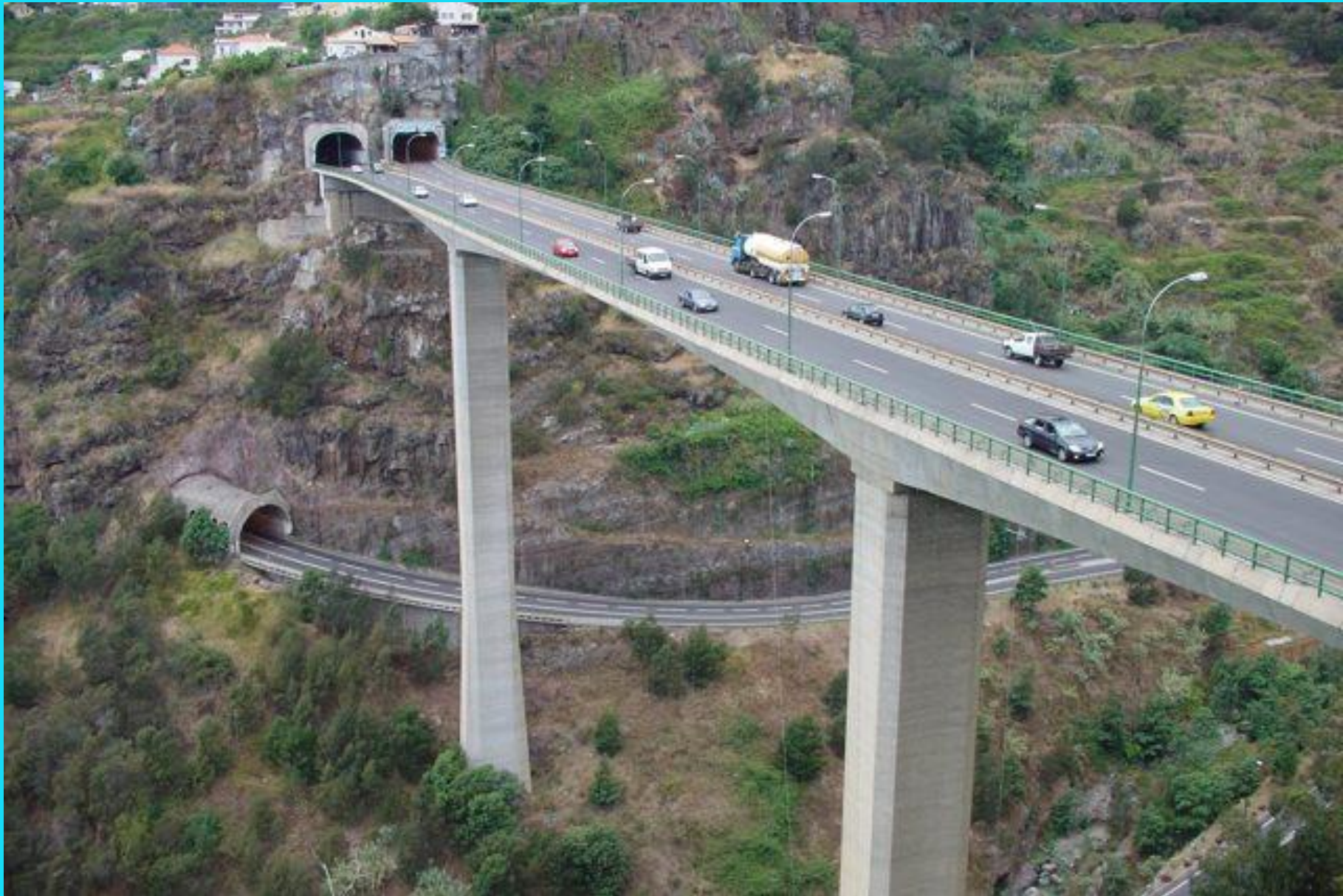
















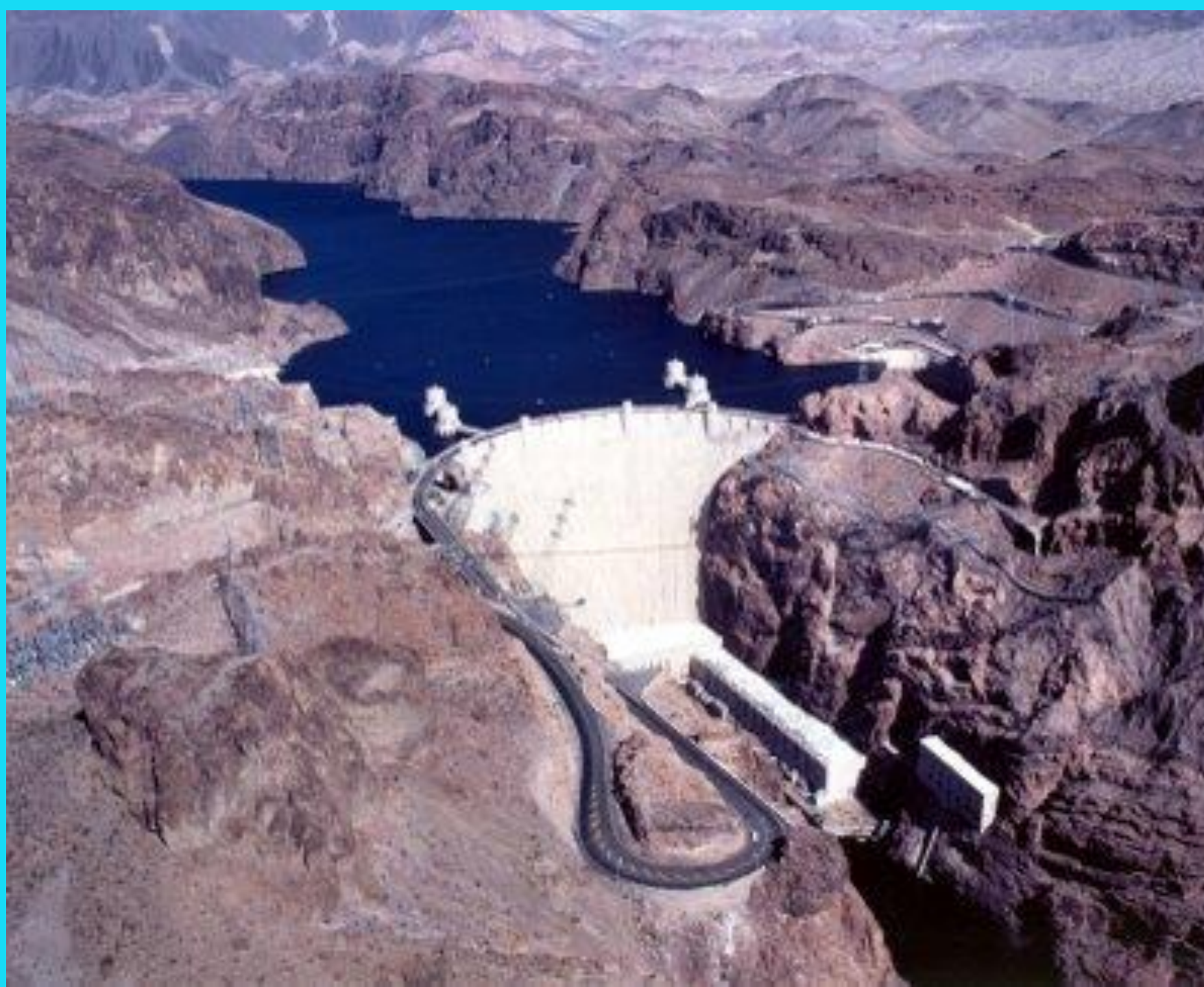








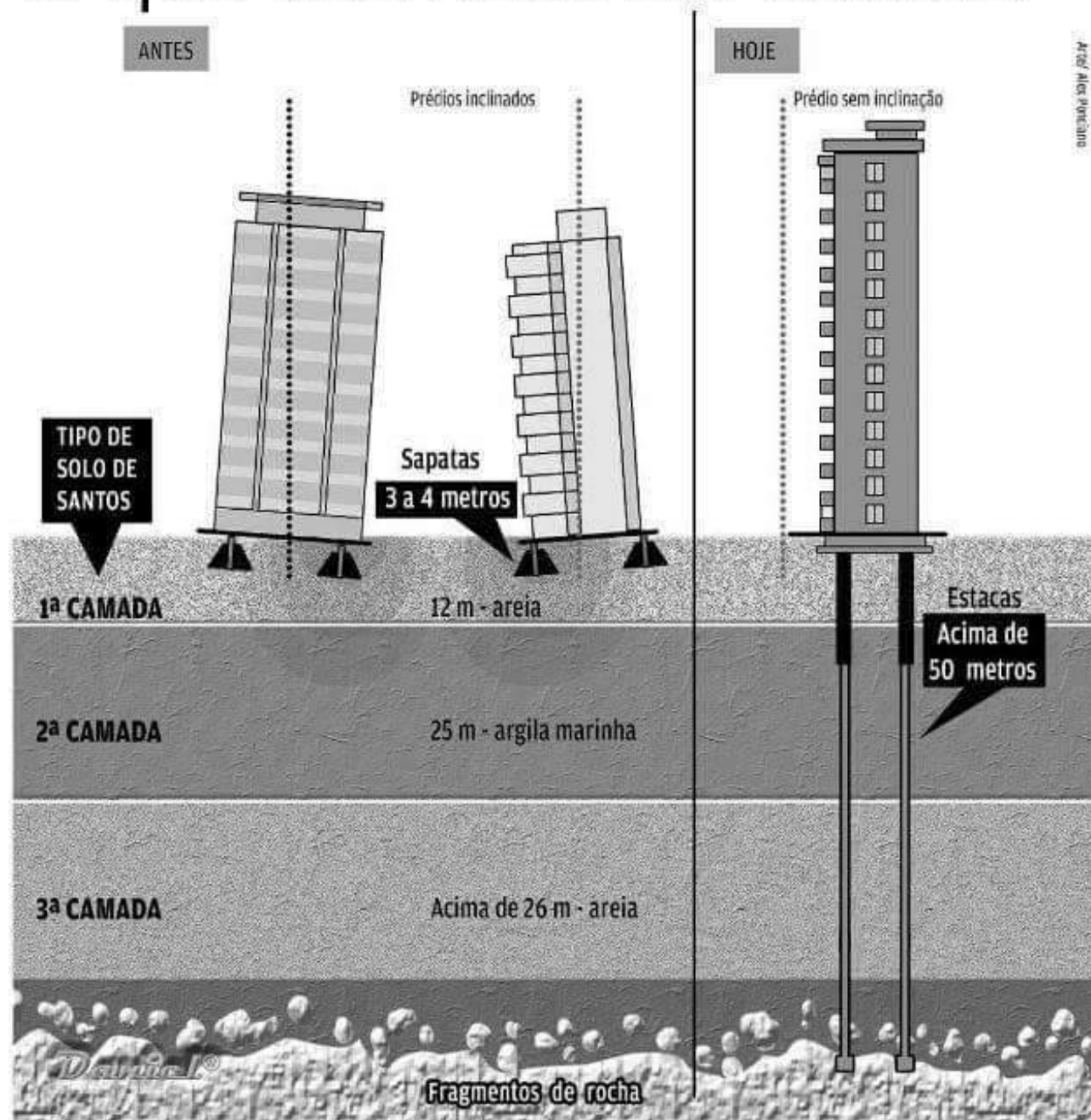








O que acontece em Santos.

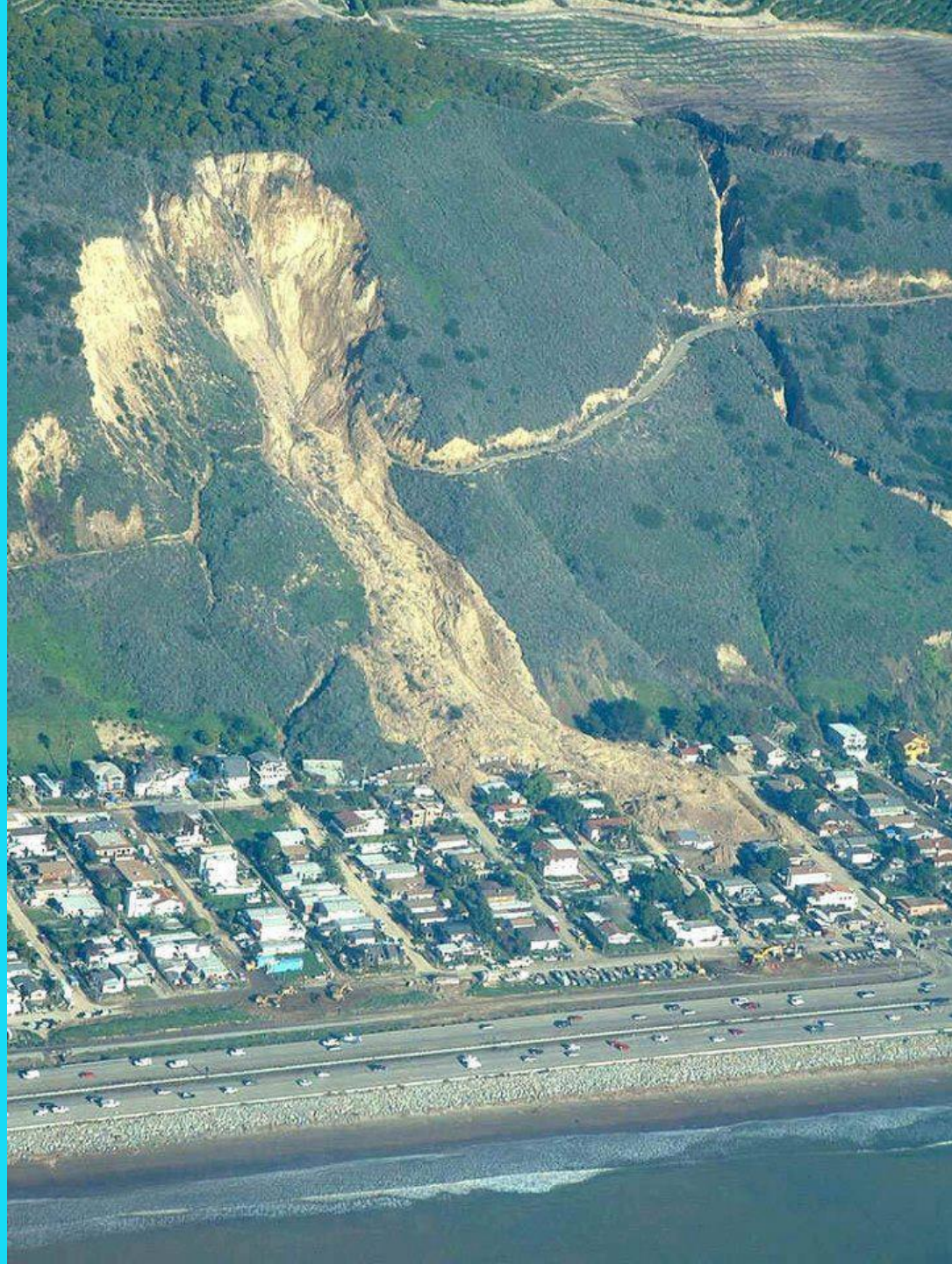


Exemplo: escorregamento em Campos do Jordão

Foto: arquivo IPT







Exemplo: deslizamento na Via Anchieta

Foto: arquivo IPT



Exemplo: colapso em Cajamar (set/86)



Foto: arquivo IPT

Exemplo: colapso em Cajamar (out/86)



Exemplo: colapso em Cajamar (jan/87)



Foto: arquivo IPT





Mineral

Rocha

Minério

- Mineral: natural, processos geológicos
 - - Fórmula química
 - - Estrutura cristalina
-
- Rocha: associação de minerais.
 - Minério: mineral ou rocha com valor econômico.

Cristal

- Forma geométrica regular limitada por faces planas,
- Tem arranjo atômico ordenado,
- A forma do cristal depende do tipo de estrutura atômica interna,
- Possui origem inorgânica, orgânica ou artificial.

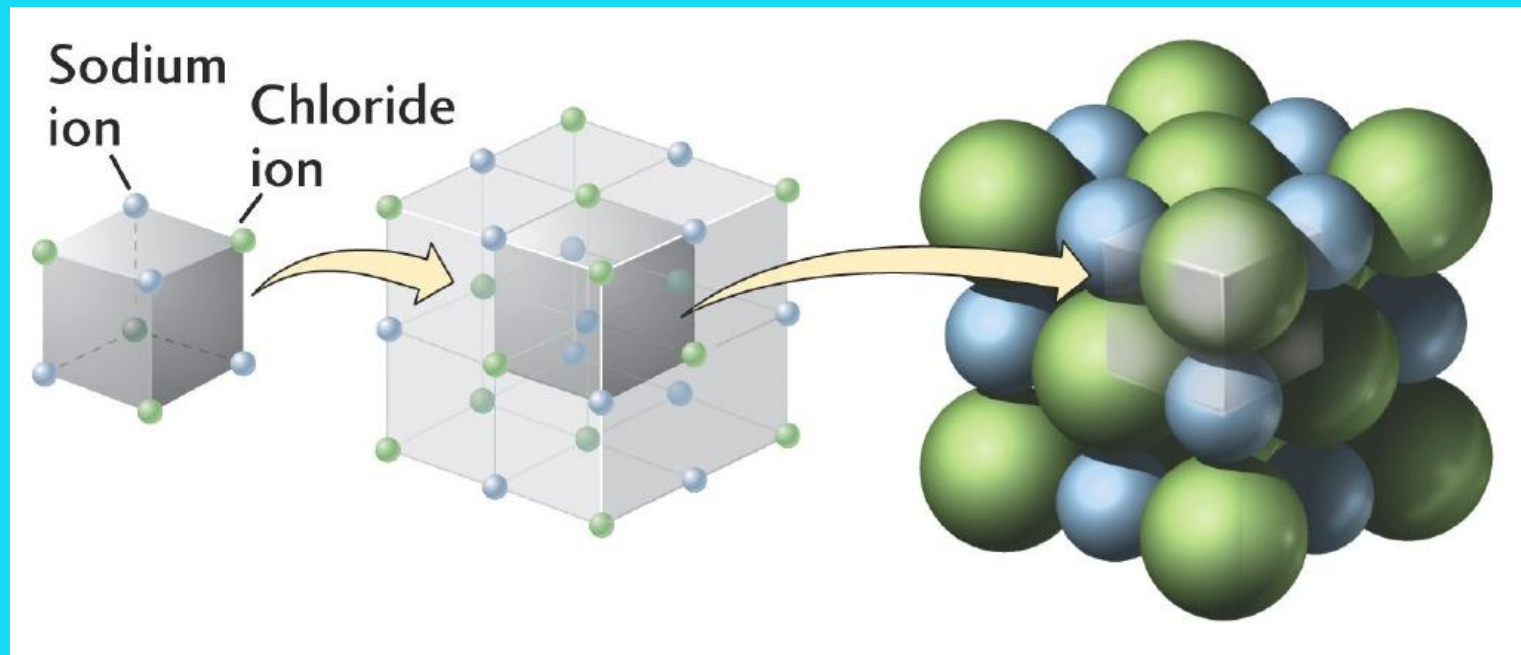


Minerais – composição química

- Formados por um único elemento químico:
 - diamante – C,
 - enxofre – S,
 - ouro – Au.
- Formados pela combinação de diferentes elementos químicos (grande maioria dos minerais):
 - quartzo – SiO_2 ,
 - calcita – CaCO_3 ,
 - olivina – $(\text{Mg,Fe})_2\text{SiO}_4$.

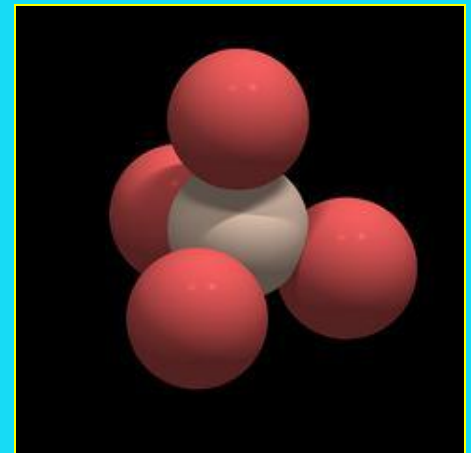
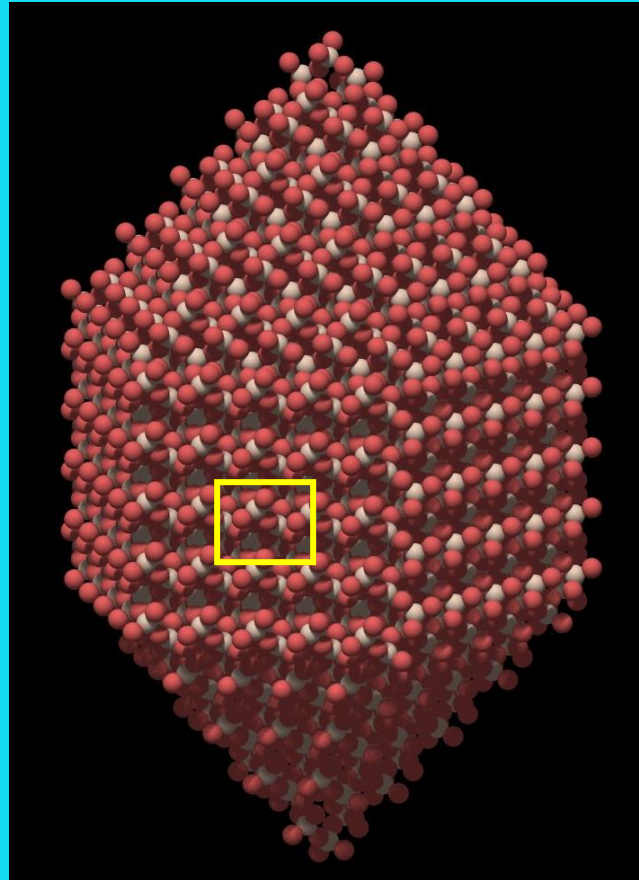
Minerais – estrutura cristalina

- Modo que os átomos dos elementos químicos são empacotados
- Padrão geométrico que os átomos assumem num sólido



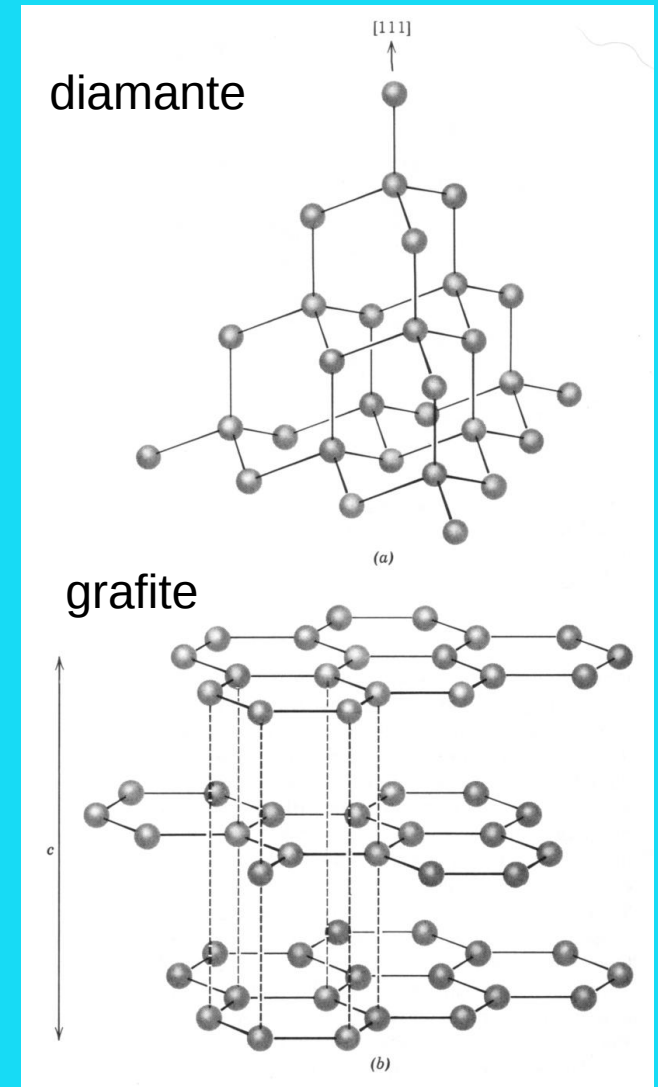
Quartzo

SiO_2



Polimorfismo

- **Polimorfos** são minerais com:
 - a mesma composição química
 - estruturas cristalinas diferentes
- Exemplo:
 - grafita (C) e diamante (C)
 - calcita (CaCO_3) e aragonita (CaCO_3)

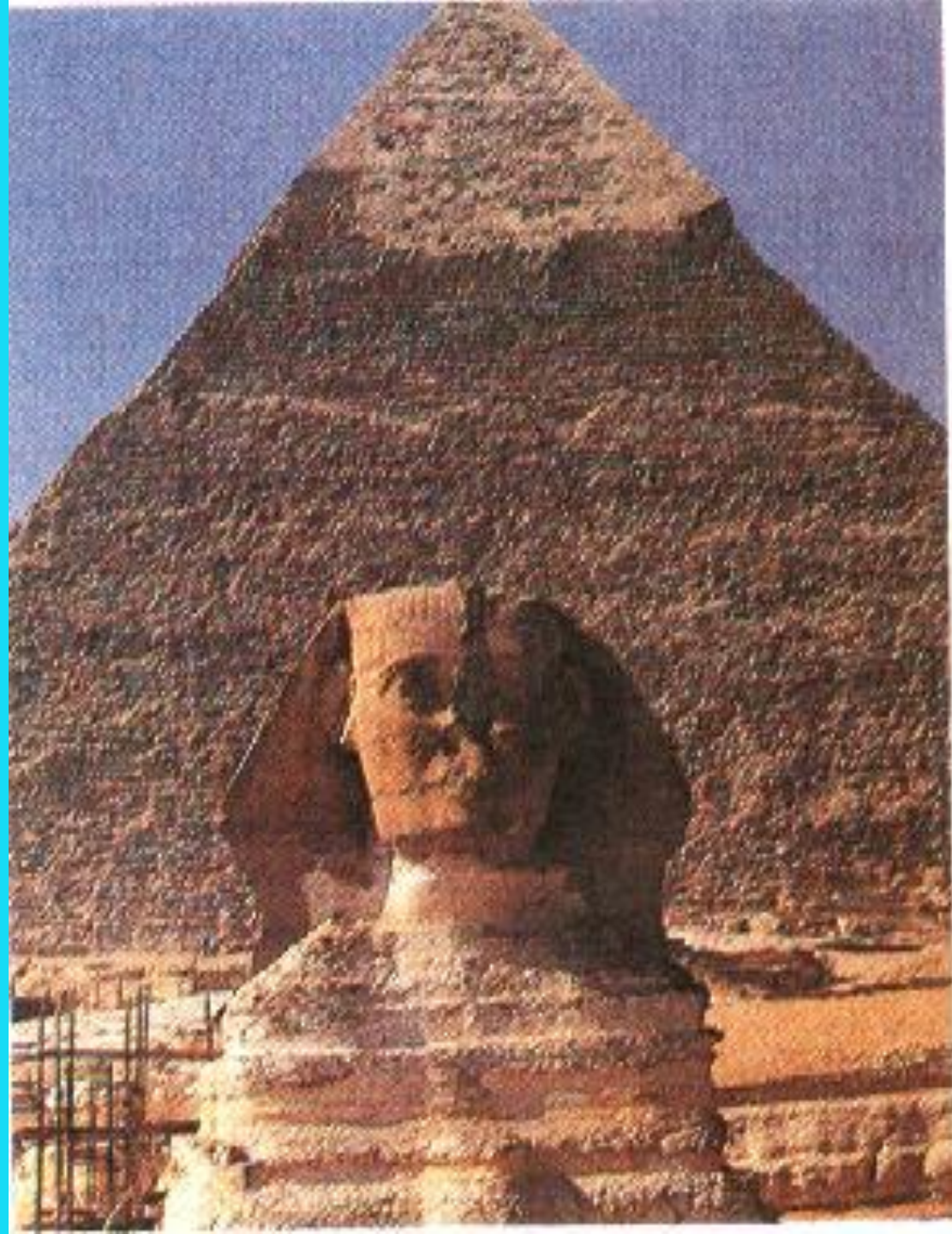


Isomorfismo

- **Isomorfos** são minerais com:
 - estrutura cristalina semelhantes
 - composição química diferente ou variável dentro de certos limites
- Exemplo:
 - calcita (CaCO_3)
 - magnesita (MgCO_3)
 - siderita (FeCO_3)







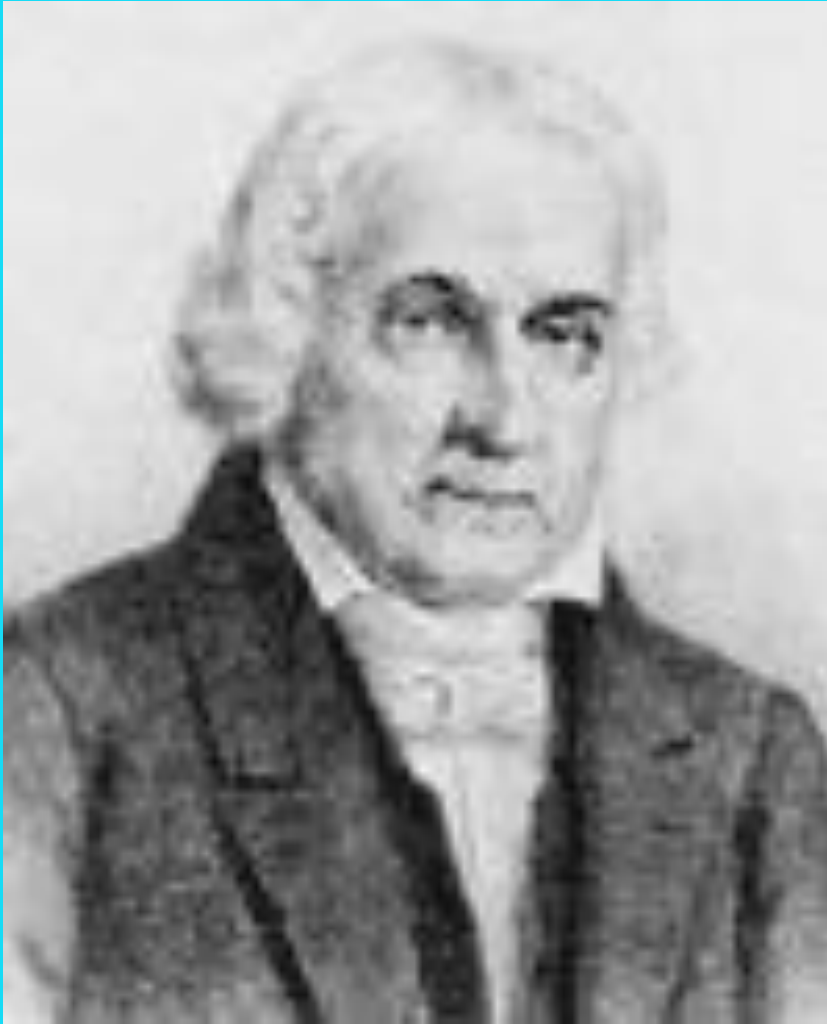


- Georg Bauer, conhecido como Georgius Agricola: reuniu todos os conhecimentos da época sobre indústria mineira, metalurgia, mineralogia e minérios –
De Re Metallica (1556)



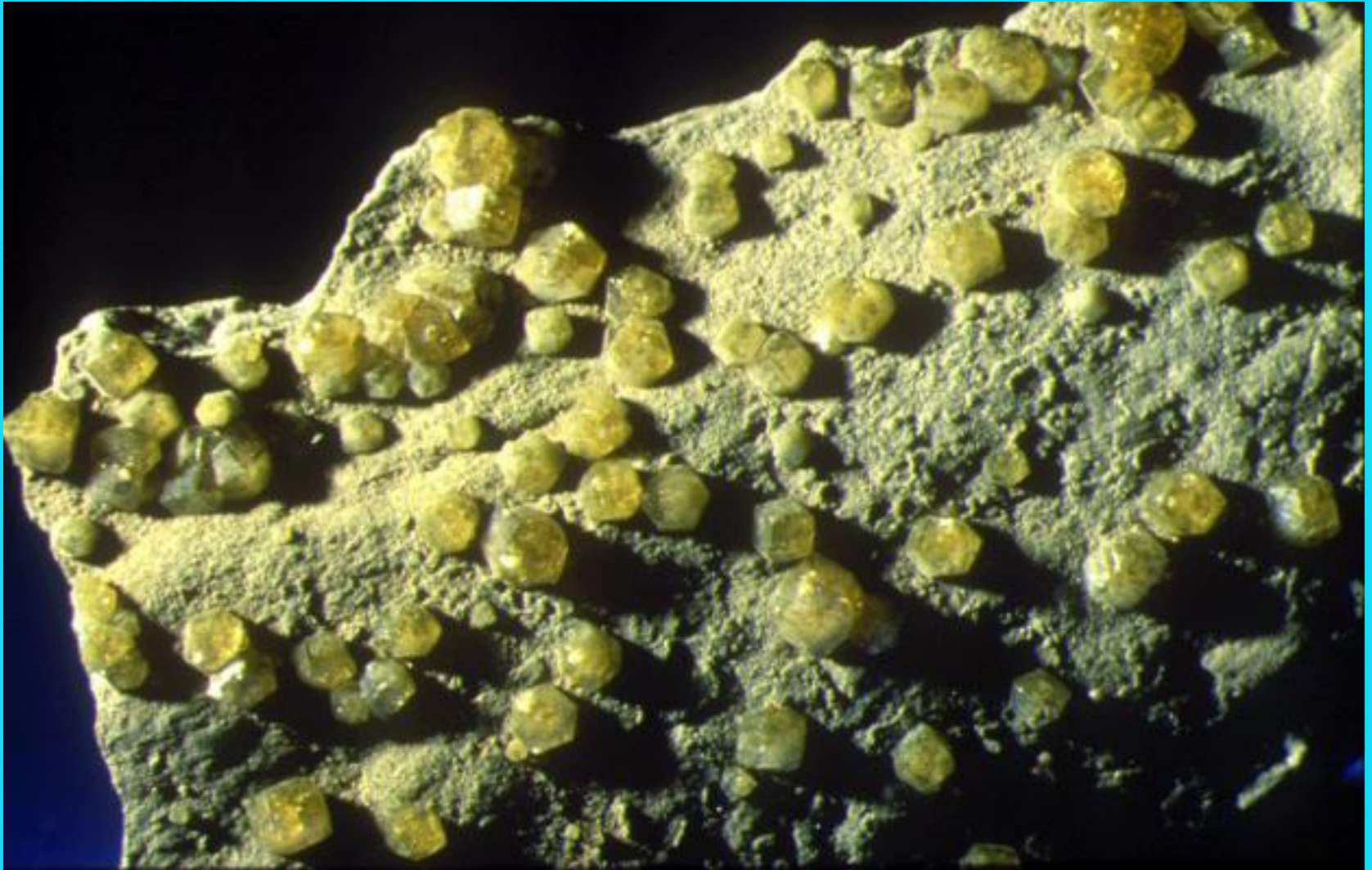
FIG. 1.3. Prospecting with a forked stick (A) and trenching (B) in the fifteenth century. (From Agricola, *De Re Metallica*, translated into English. Dover Publications, New York, 1950.)

Investigação Mineralógica no Brasil



- Irmãos Andrada: José Bonifácio de Andrada e Silva* e Martim Francisco Ribeiro de Andrada**
 - 1790: tratado sobre os diamantes do Brasil, publicado nas atas da Sociedade de História Natural de Paris em 1792
 - 1805: Diário de uma viagem mineralógica pela província de São Paulo**
 - 1820: Viagem mineralógica na província de São Paulo*

ANDRADITA



USOS DA MINERALOGIA

- Caracterização e processamento de minérios
- Novos materiais para uso industrial
- Cerâmica
- Metalurgia
- Hobby

Tecnologia :: Indústria Química

Duro na queda

Braskem produz resinas com nanotecnologia que resultam em plásticos mais resistentes

Marcos de Oliveira

Edição Impressa 132 - Fevereiro 2007

Um plástico mais rígido e resistente a impactos deverá estar em breve disponível para compor painéis e pára-choques de automóveis, gabinetes de aparelhos eletrônicos, embalagens e uma infinidade de utensílios domésticos.

A argila utilizada é formada por minerais, chamados de **betonitas e montmorilonitas**, dispostos em camadas. No processo desenvolvido pelos pesquisadores da UFRGS e da empresa, as folhas empilhadas da argila se dispersam, com espessuras de 1 nanômetro, pelo polipropileno, se fixando nas moléculas da resina e formando um material chamado de nanocompósito. “O novo material melhora o produto final com 30% a mais de rigidez e quatro vezes mais resistência a impactos”, diz o gerente de nanotecnologia da Braskem, Manoel Lisboa da Silva Neto, que trabalha junto com um grupo de oito pesquisadores, sendo quatro doutores e quatro técnicos dedicados a essa área no Centro de Tecnologia e Inovação da empresa na cidade de Triunfo, próxima a Porto Alegre. Eles fazem parte de um grupo de 170 pessoas que atuam no mesmo centro.

Formação dos minerais

- Cristalização a partir de um magma.
- Precipitação a partir de uma solução (líquida ou gasosa).
- Crescimento do cristal no estado sólido (recristalização).











MARCA

REGISTRADA



PHOSPHOROS DE SEGURANÇA.







12 CLASSES MINERAIS

- Elementos nativos
- Sulfetos
- Sulfossais
- Óxidos
- Halóides
- Carbonatos
- Nitratos
- Boratos
- Fosfatos
- Sulfatos
- Tungstatos
- Silicatos

- Minerais com mesmo radical aniônico apresentam propriedades físicas e morfológicas muito mais semelhantes entre si que minerais com o mesmo cátion
- Minerais com mesmo radical aniônico tendem a ocorrer associados na natureza, sendo originados por processos físico-químicos semelhantes
- Esta prática de classificação está de acordo com a nomenclatura de compostos utilizada na Química Inorgânica

ROCHAS

ÍGNEAS



SEDIMENTARES

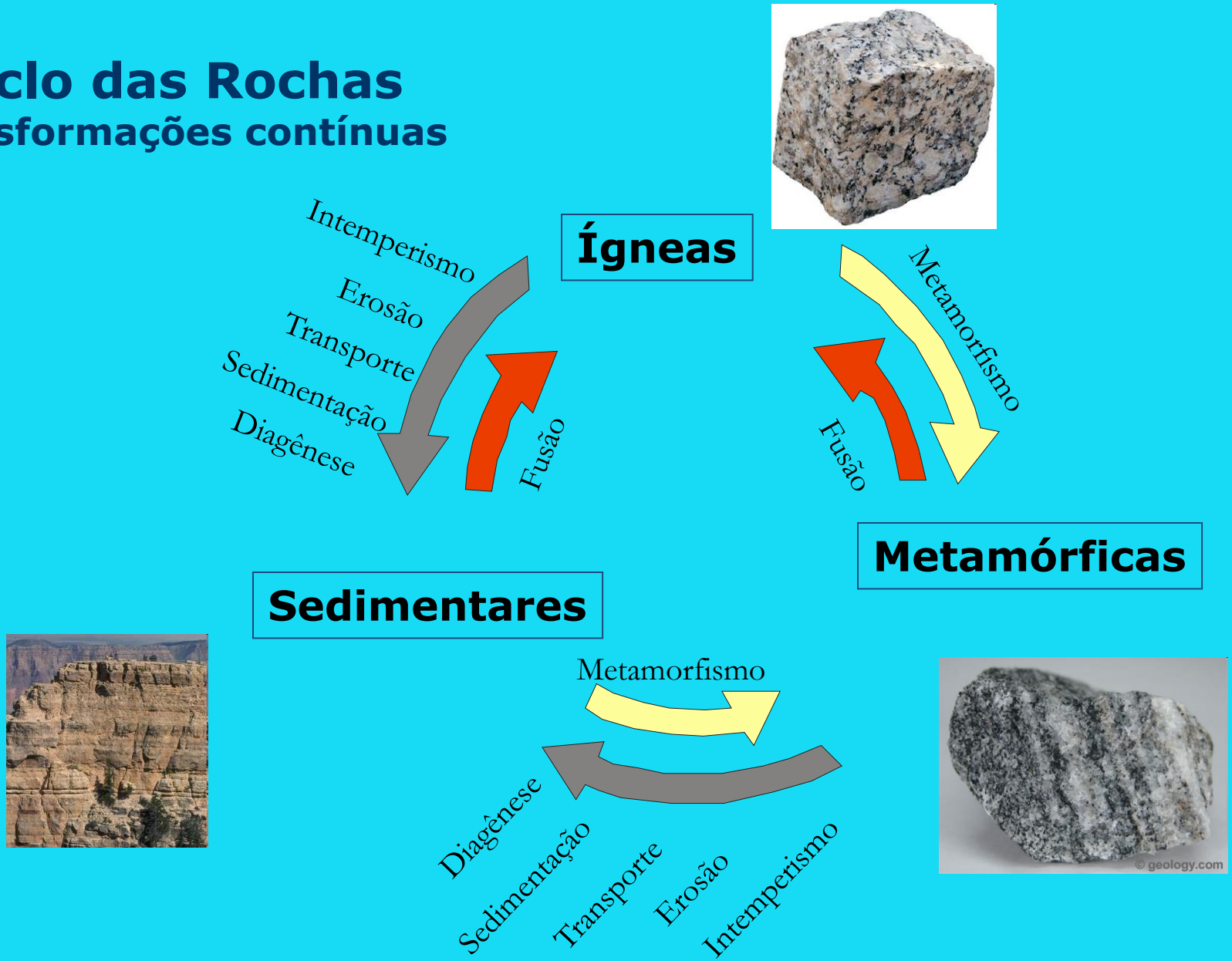


METAMÓRFICAS



Ciclo das Rochas

Transformações contínuas



Meteoritos



- Corpos metálicos ou rochosos caídos na superfície terrestre;
- Corpos pequenos que atingem a atmosfera com alta velocidade, sendo freados com o atrito com o ar;
- Calor produzido pelo atrito chega a fundir parcialmente as partes externas do meteorito, formando uma crosta de material vitrificado.

Visita ao Museu de Geociências











O Museu de Geociências foi iniciado em 1934 pelo professor Ettore Onorato. O museu possui cerca de 5 mil peças entre minerais, rochas, meteoritos, gemas lapidadas e em estado natural. A maior parte proveniente do Brasil através de doações, trocas e aquisições feitas por alunos, professores e interessados por assuntos geológicos. Existem também peças vindas de várias partes do mundo.



1.1.1 Grupo do ouro

F m3m 4/m 3 2/m

1.1.1.1 Ouro Au

1.1.1.2 Prata Ag

1.1.1.3 Cobre Cu

1.1.1.4 Chumbo Pb

1.1.1.5 Alumínio Al



Locality: [Alta Floresta, Mato Grosso, Central-West Region, Brazil](#)
3.7 gram hoppered modified alluvial gold crystal measuring 9 x 7 mm.
Crystal shows cubic and dodecahedral faces.
Photograph by Edward Rosenzweig

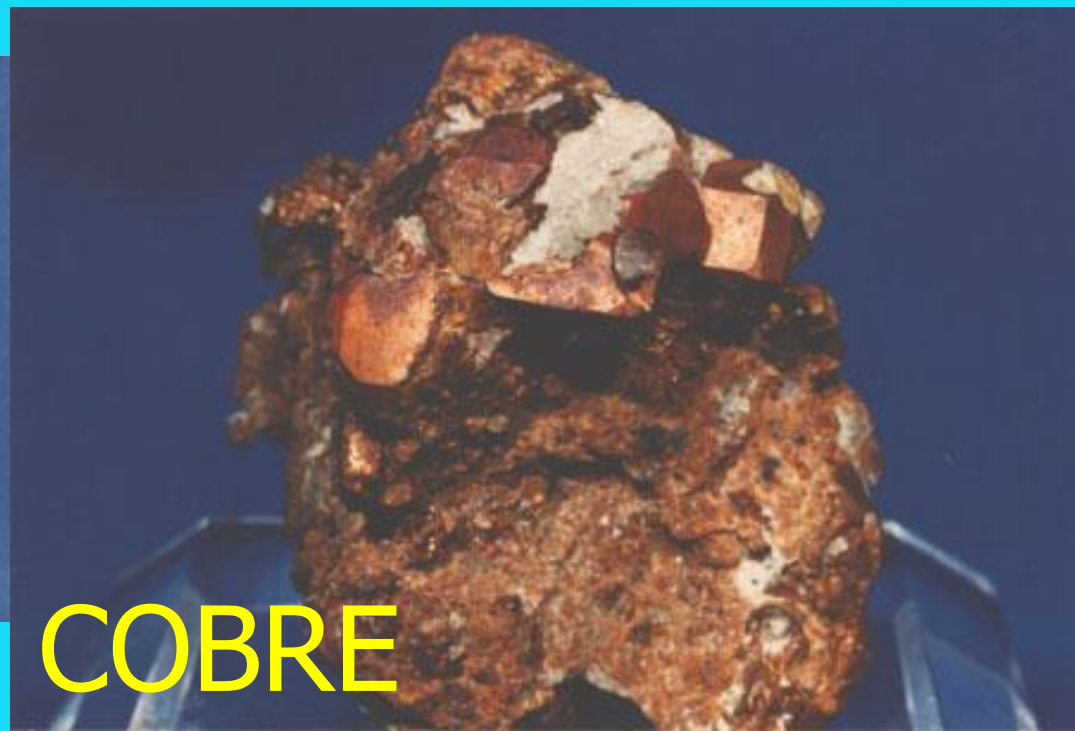
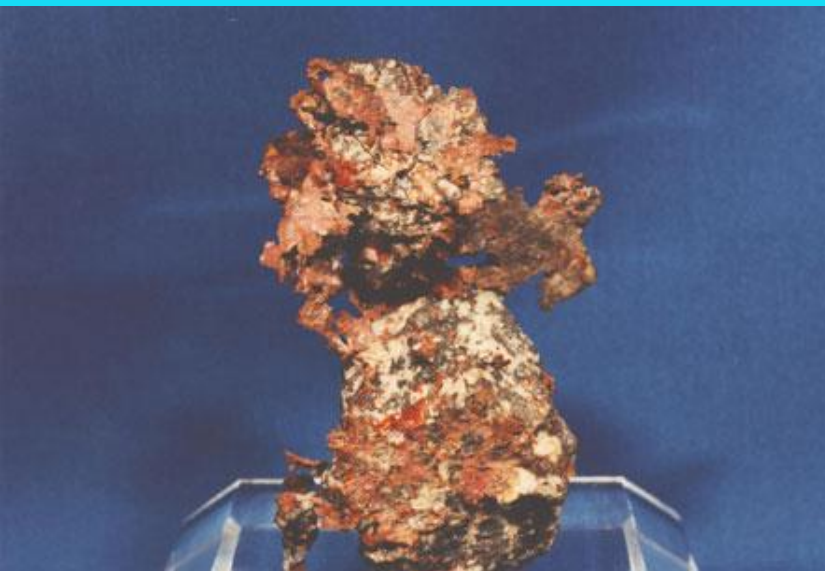




© Dane S. Johnson



PRATA



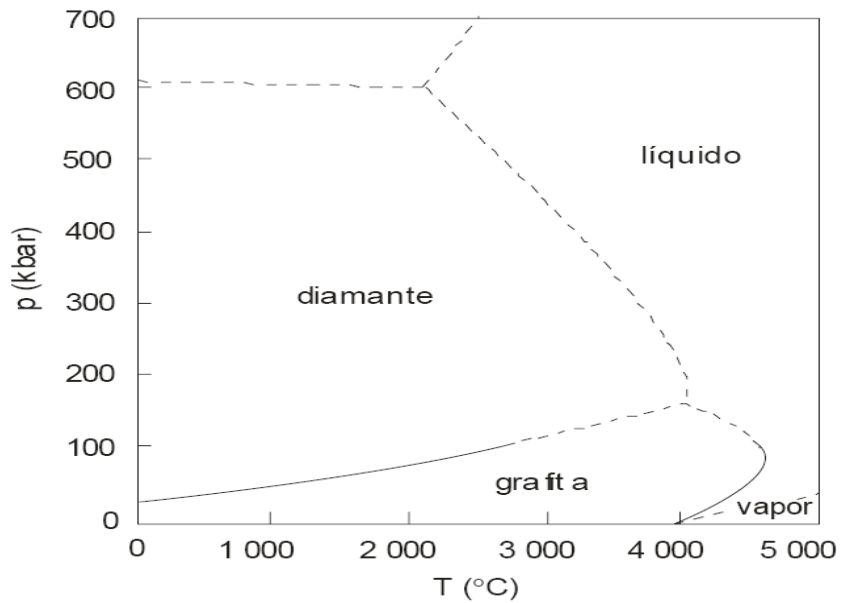


Fig.1.4: Diagrama de estado do carbono. As linhas cheias indicam fronteira de conhecimento garantido; as linhas tracejadas fronteiras aproximadas.

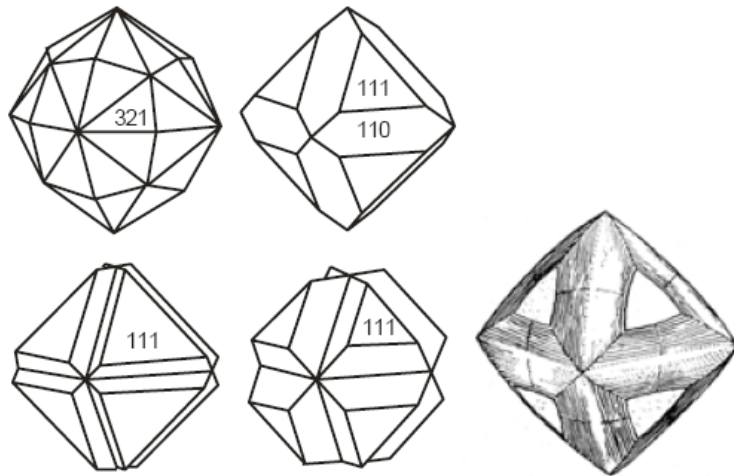


Figura 1.7: Diamante, exemplos da morfologia dos cristais. $4/m\bar{3}2/m$

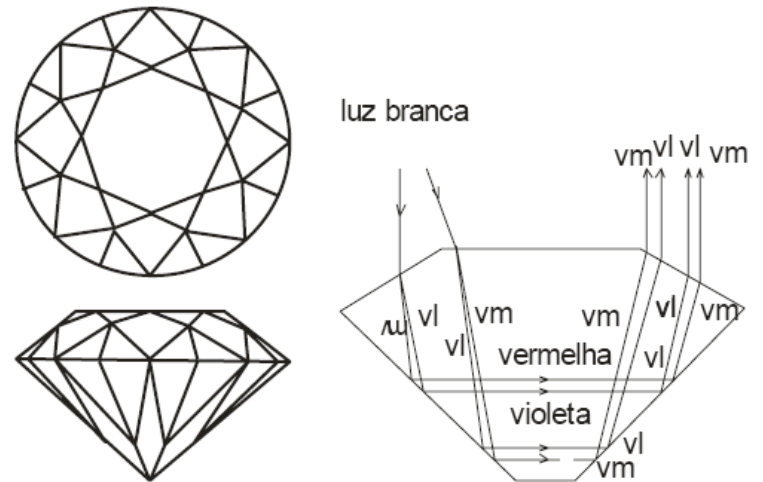
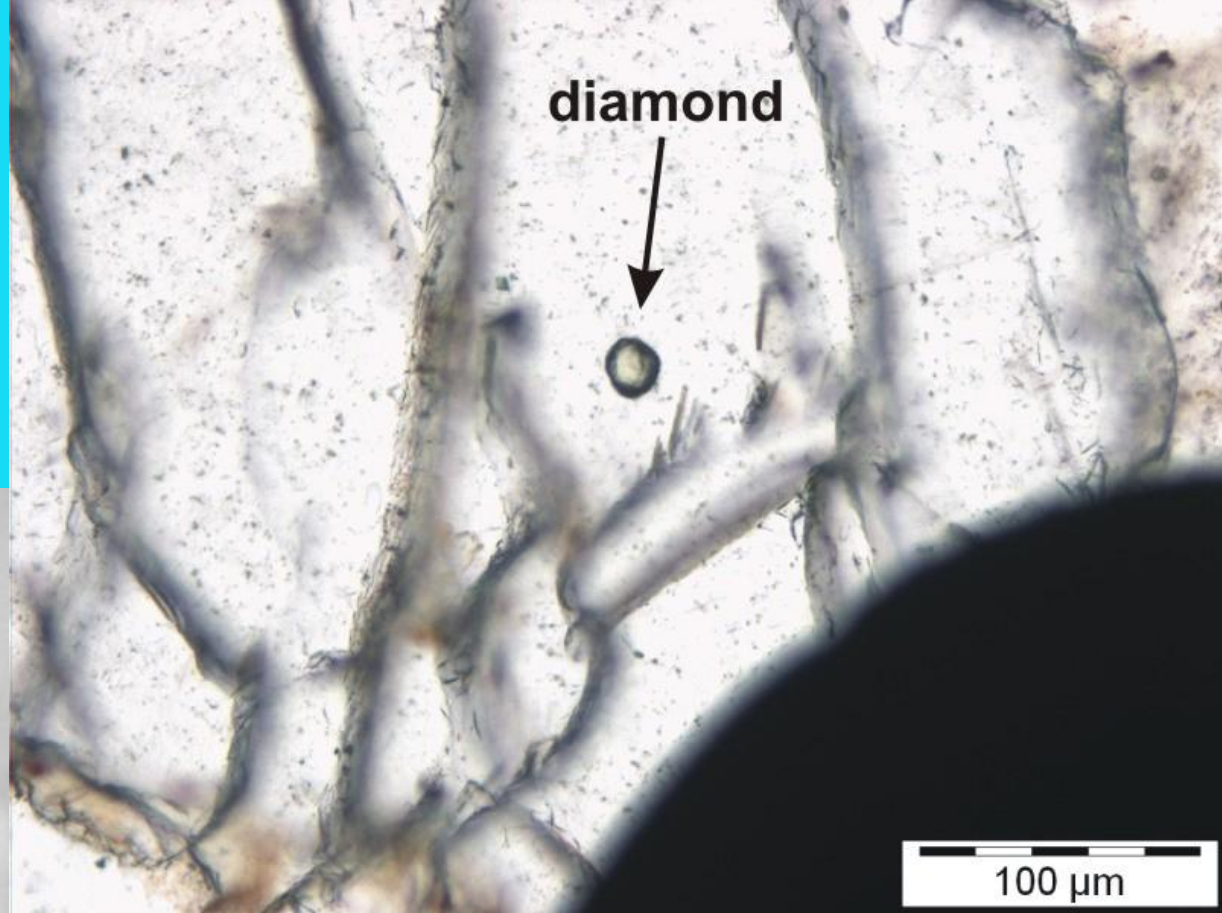


Fig.1.8: Brilhante, um dos formatos da lapidação e da dispersão da luz.



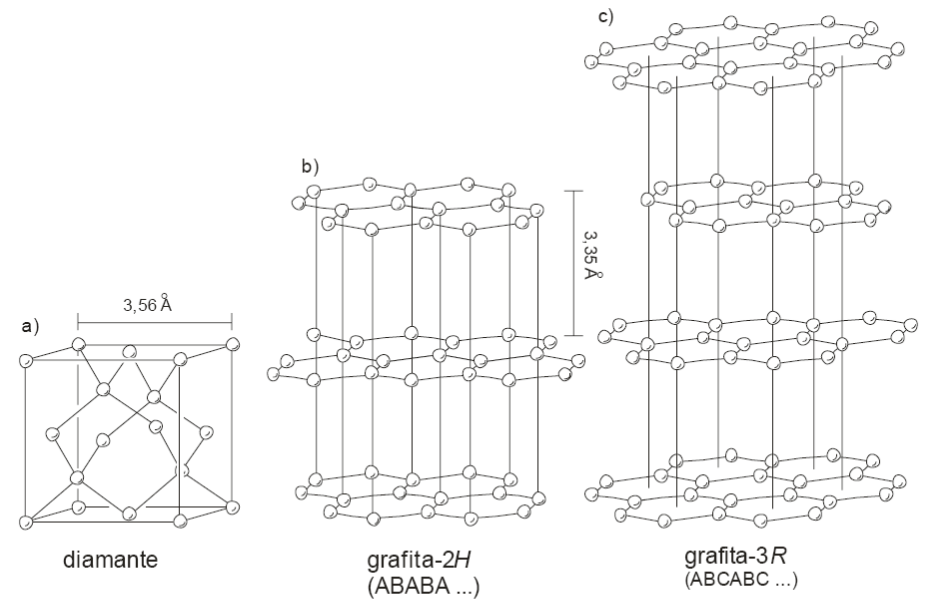


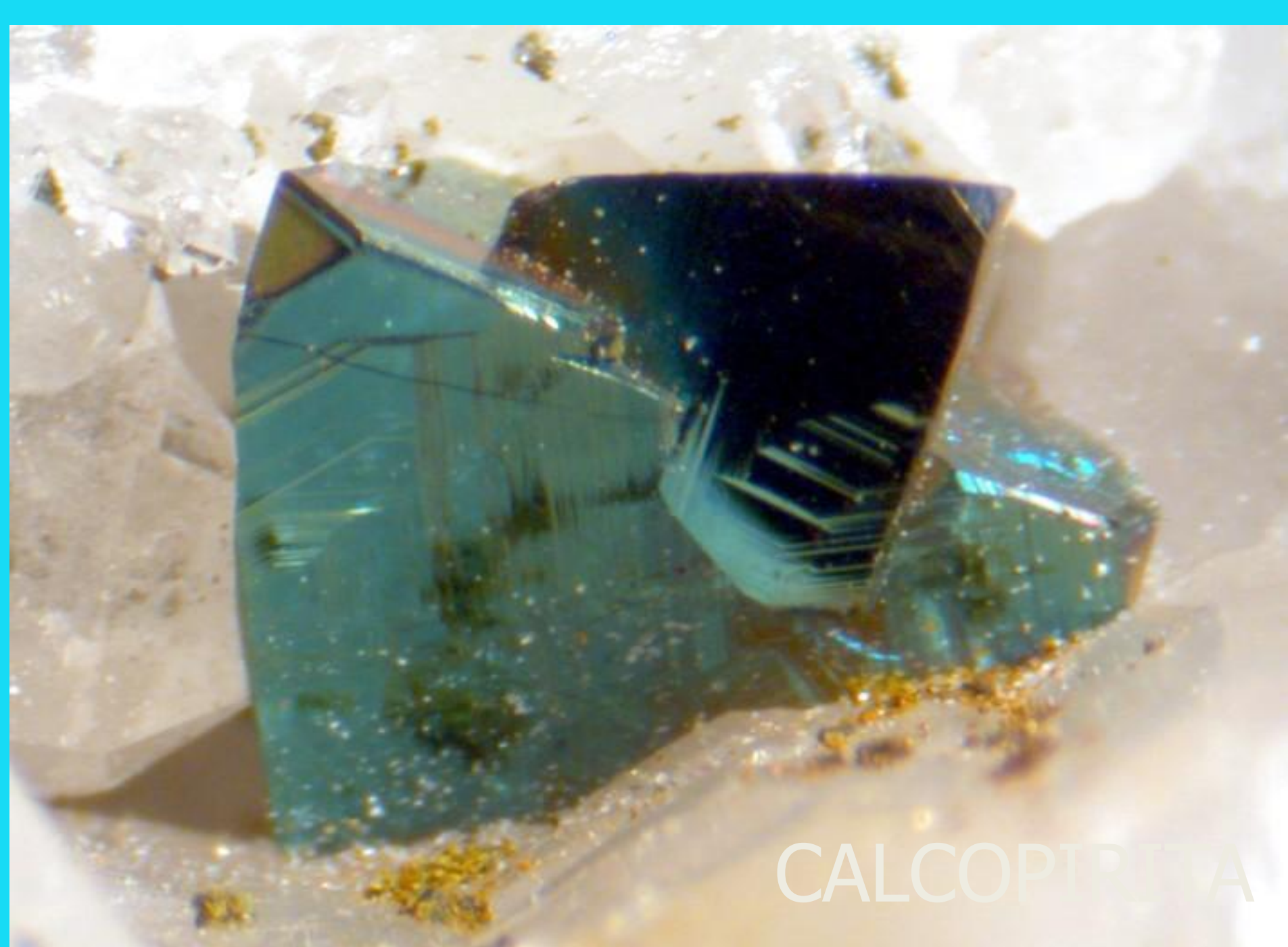
Fig.1.6: Estrutura do diamante (a), da grafita-2H (b) e da grafita-3R (c)





ESFALERITA





CALCOPTRITE



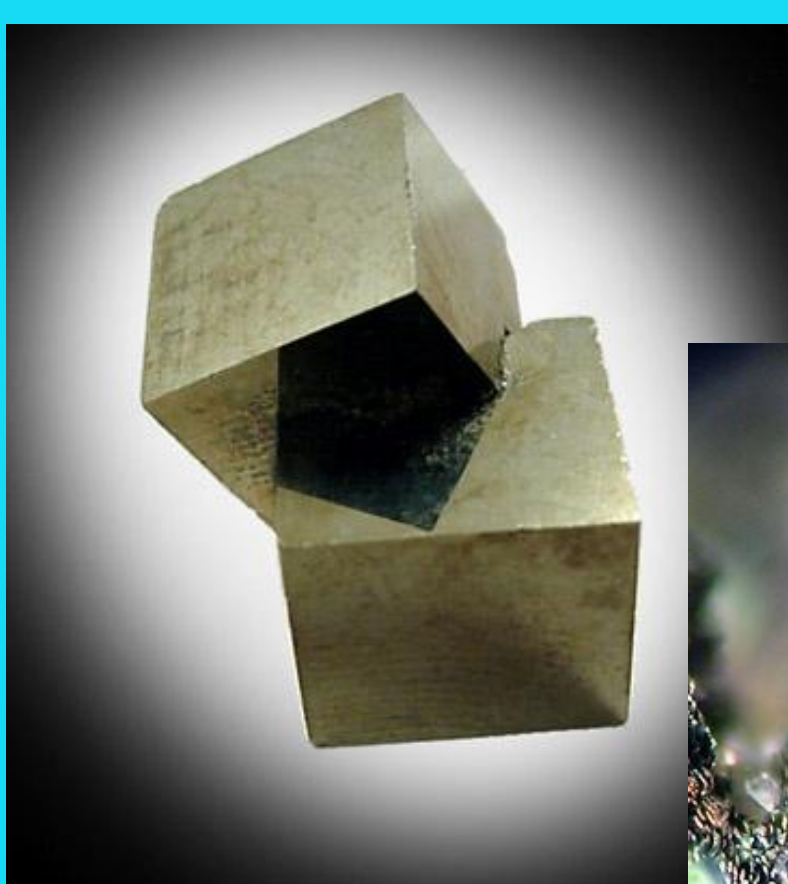
GALENA
PbS

CAS 1





CINÁBRIO



PIRITA



MOLYBDENITE

MoS_2

LAB 1

- tetraedrita $\text{Cu}_{12}\text{Sb}_4\text{S}_{13}$
- tennantita $\text{Cu}_{12}\text{As}_4\text{S}_{13}$
- freibergita $\text{Ag}_{12}\text{Sb}_4\text{S}_{13}$

cúbica $(\bar{4} 3m)$
 — " —
 — " —

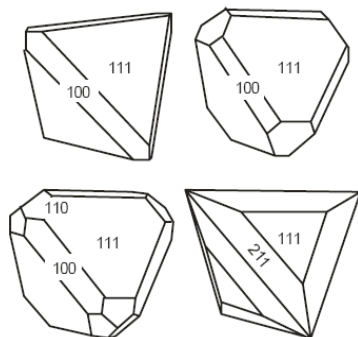


Fig.2.18: Tetraedrita, exemplos da morfologia dos cristais $\bar{4}3m$



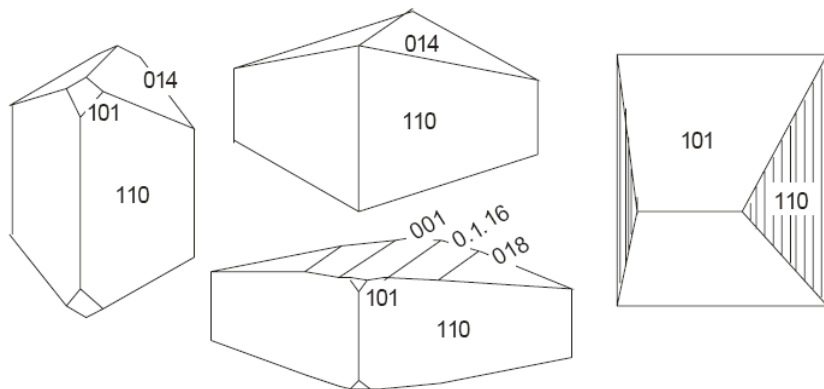


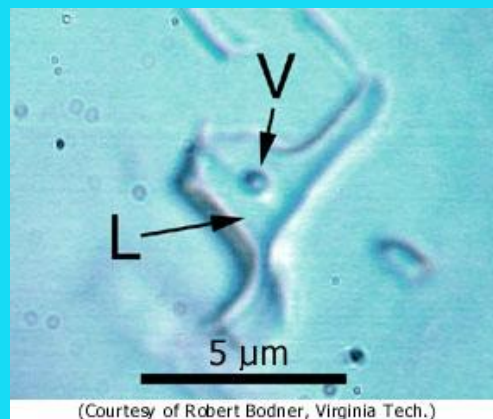
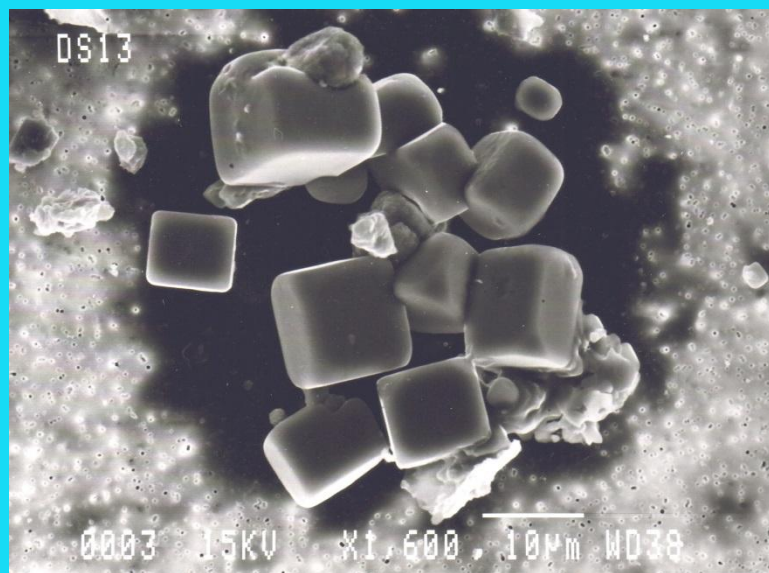
Fig.2.19: Arsenopirita ,exemplos da morfologia dos cristais.
Pseudosimetria $2m\ 2m\ 2m$



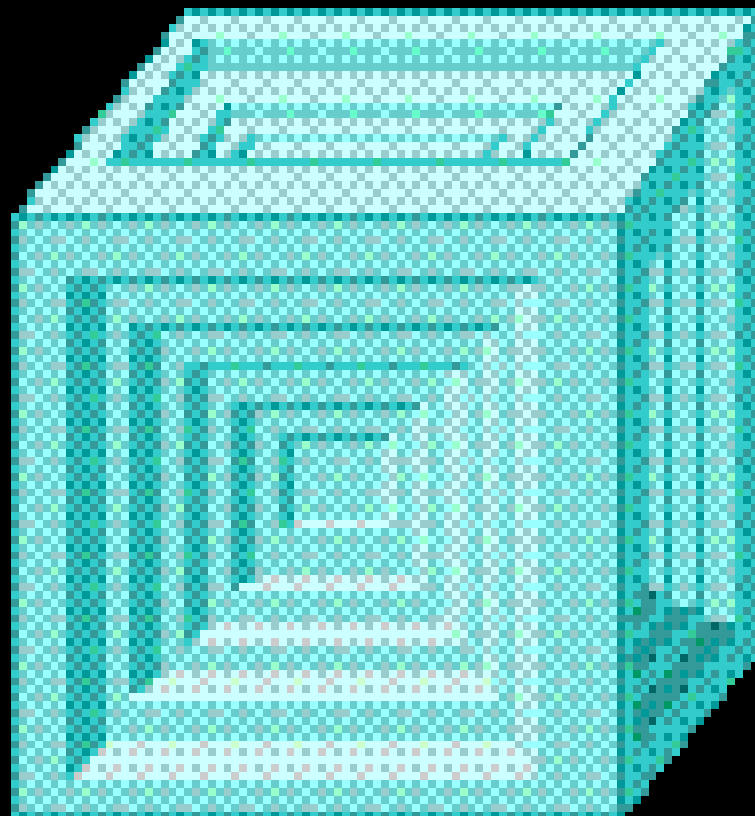
Halite



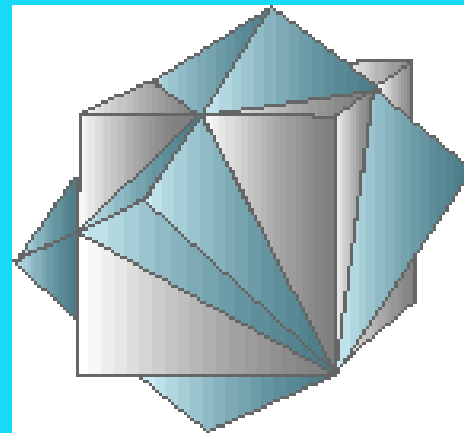
© Université Laval



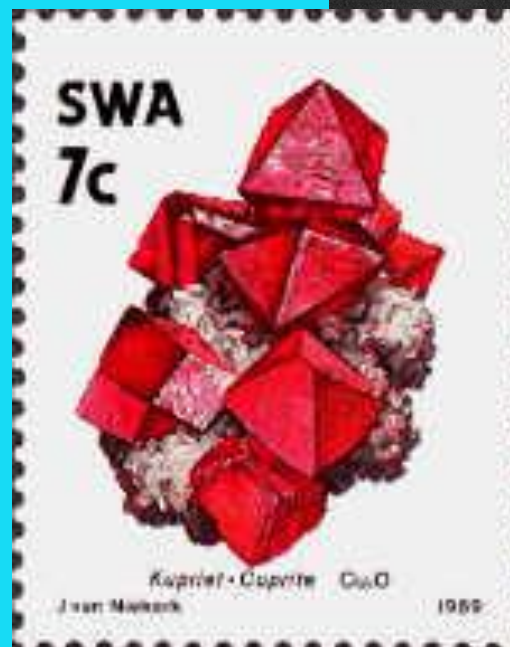
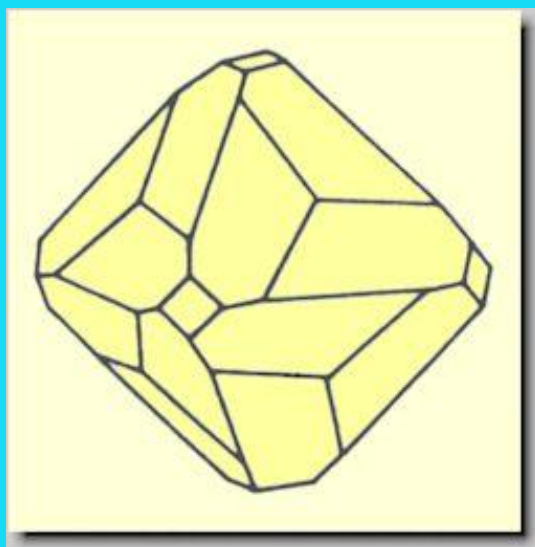
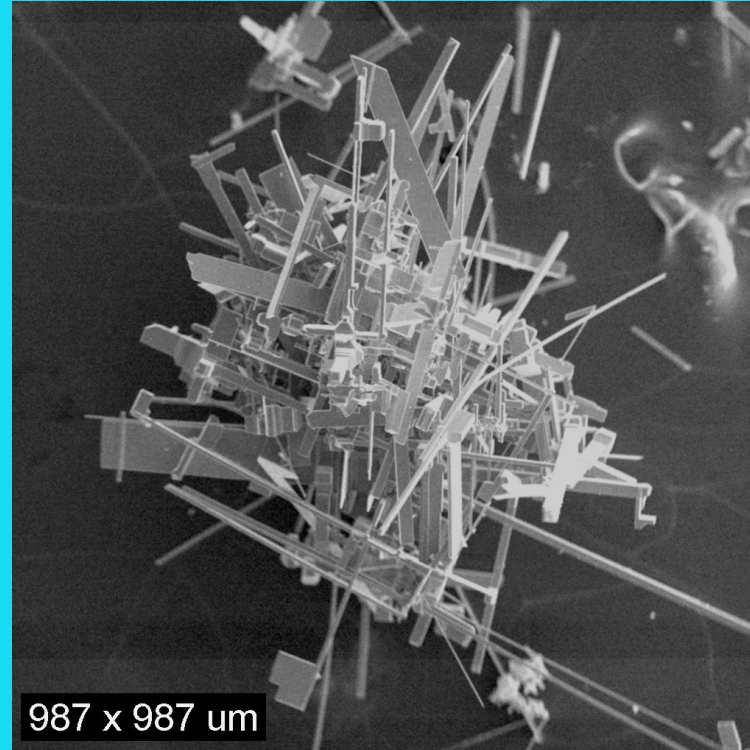
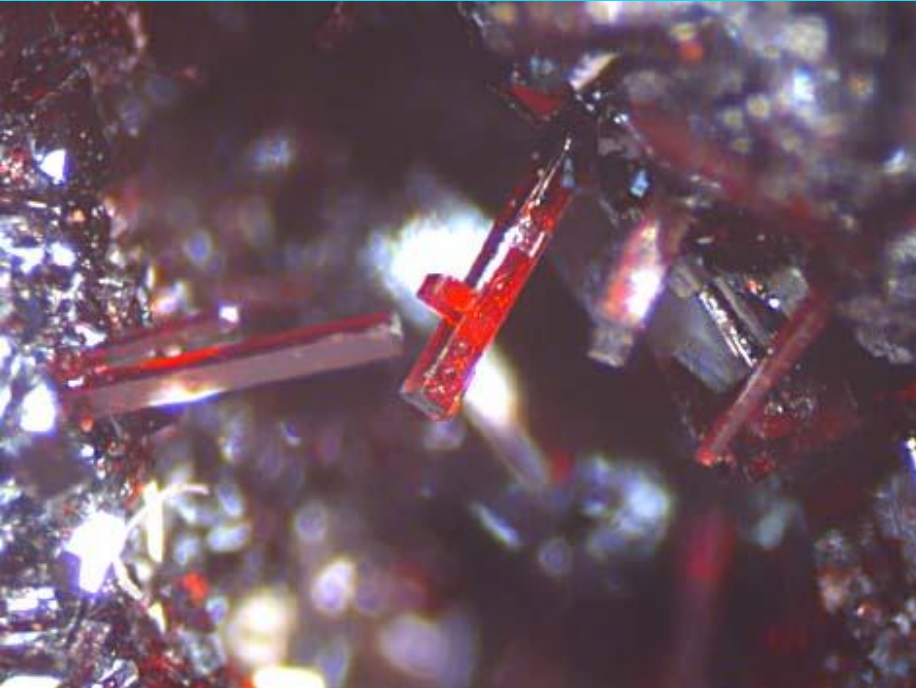
(Courtesy of Robert Bodner, Virginia Tech.)





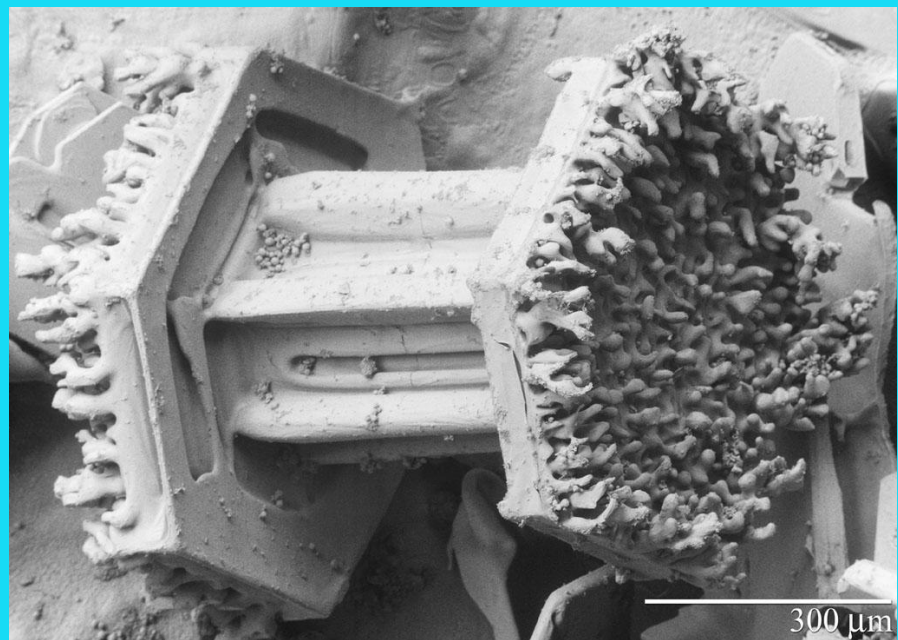
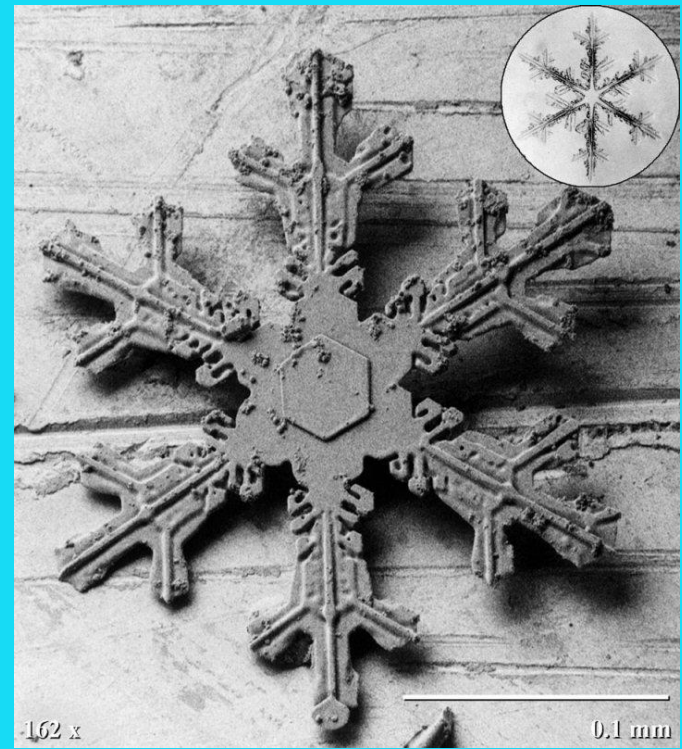
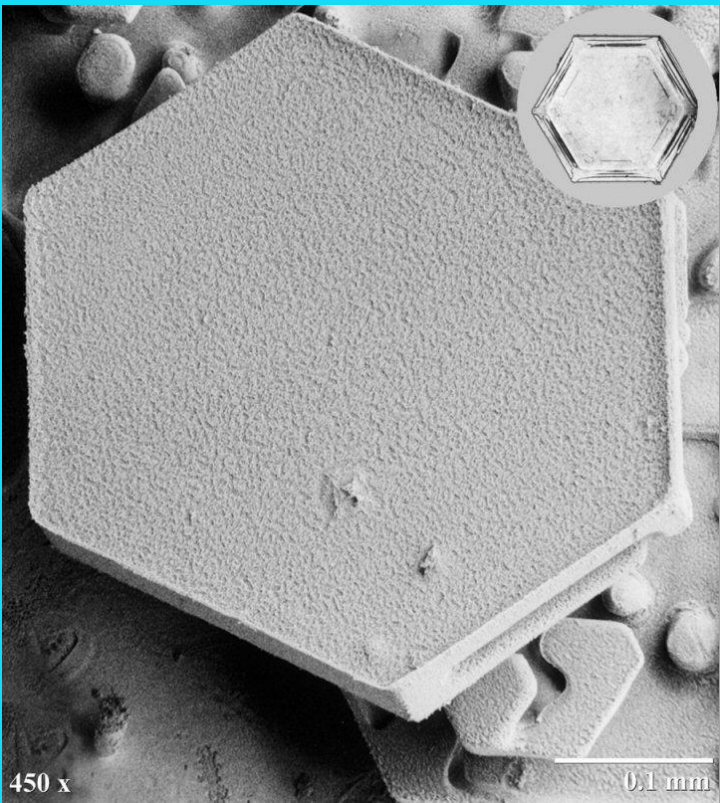












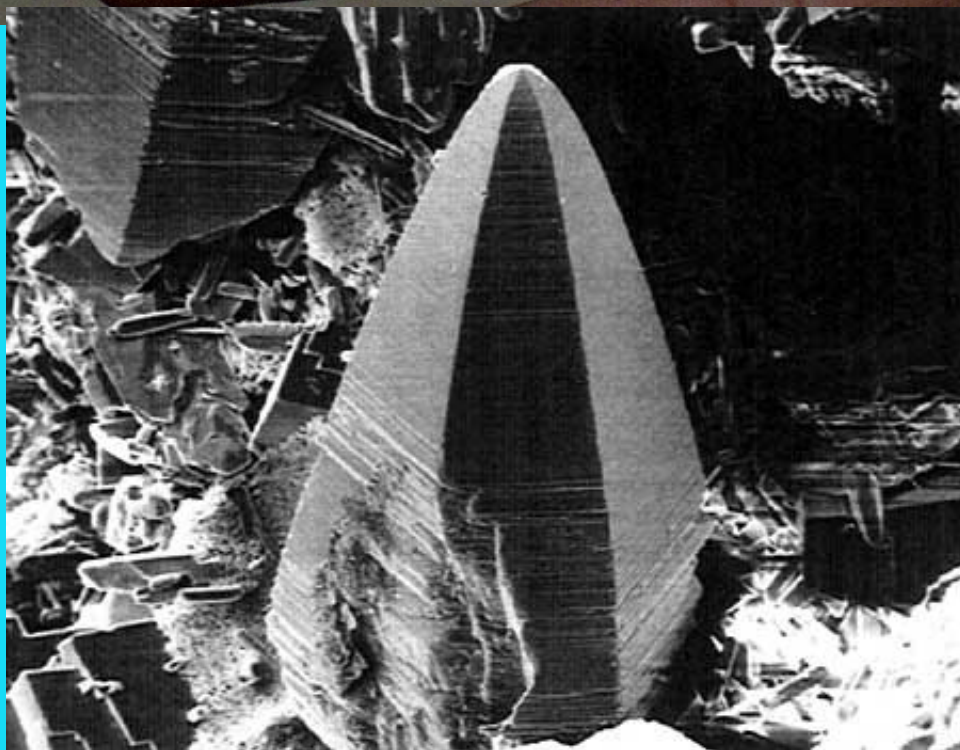
氧化鋅物

Zincite

紅亜鉛鉱

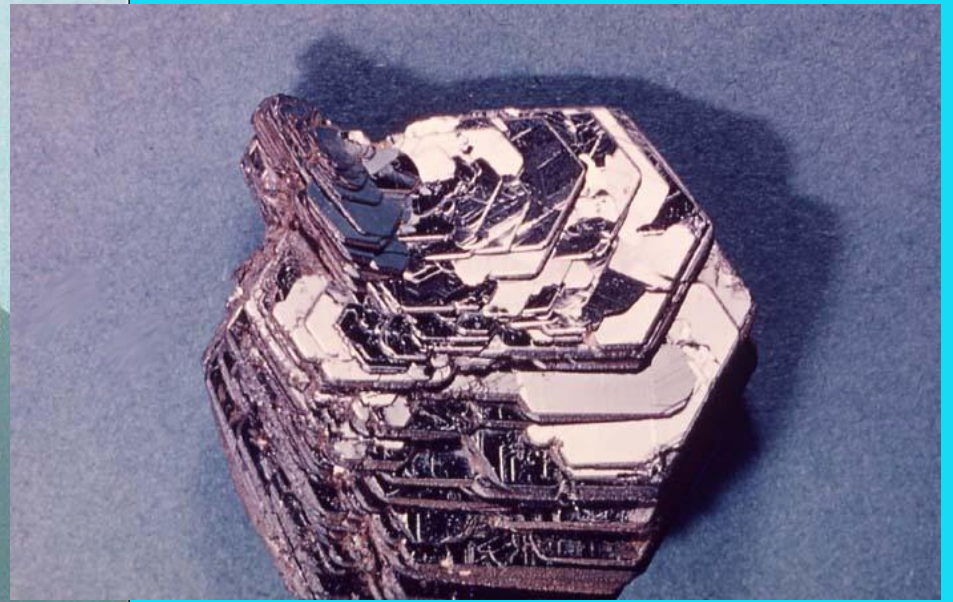
ZnO

Franklin x New Jersey

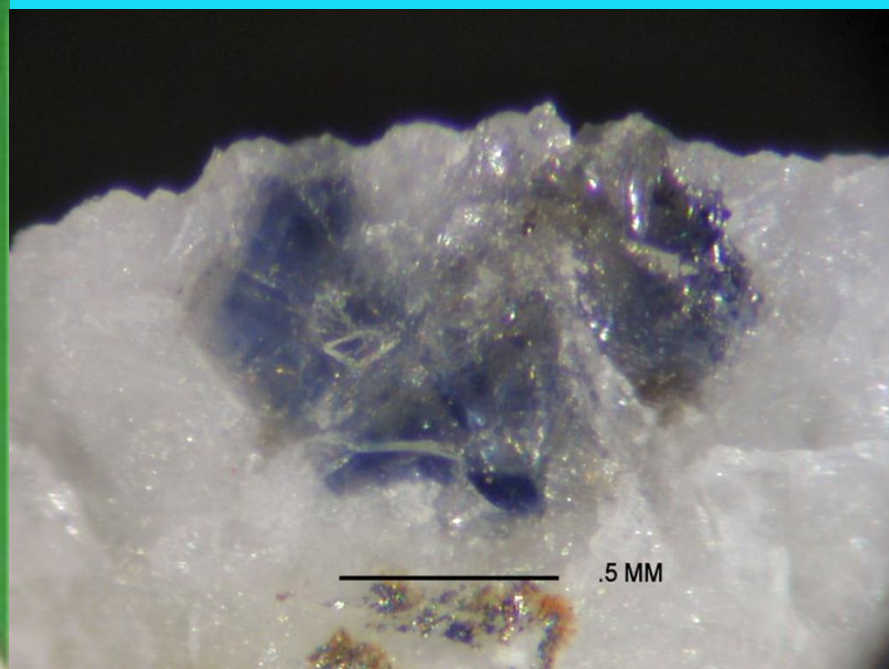




Hematita – Fe_2O_3

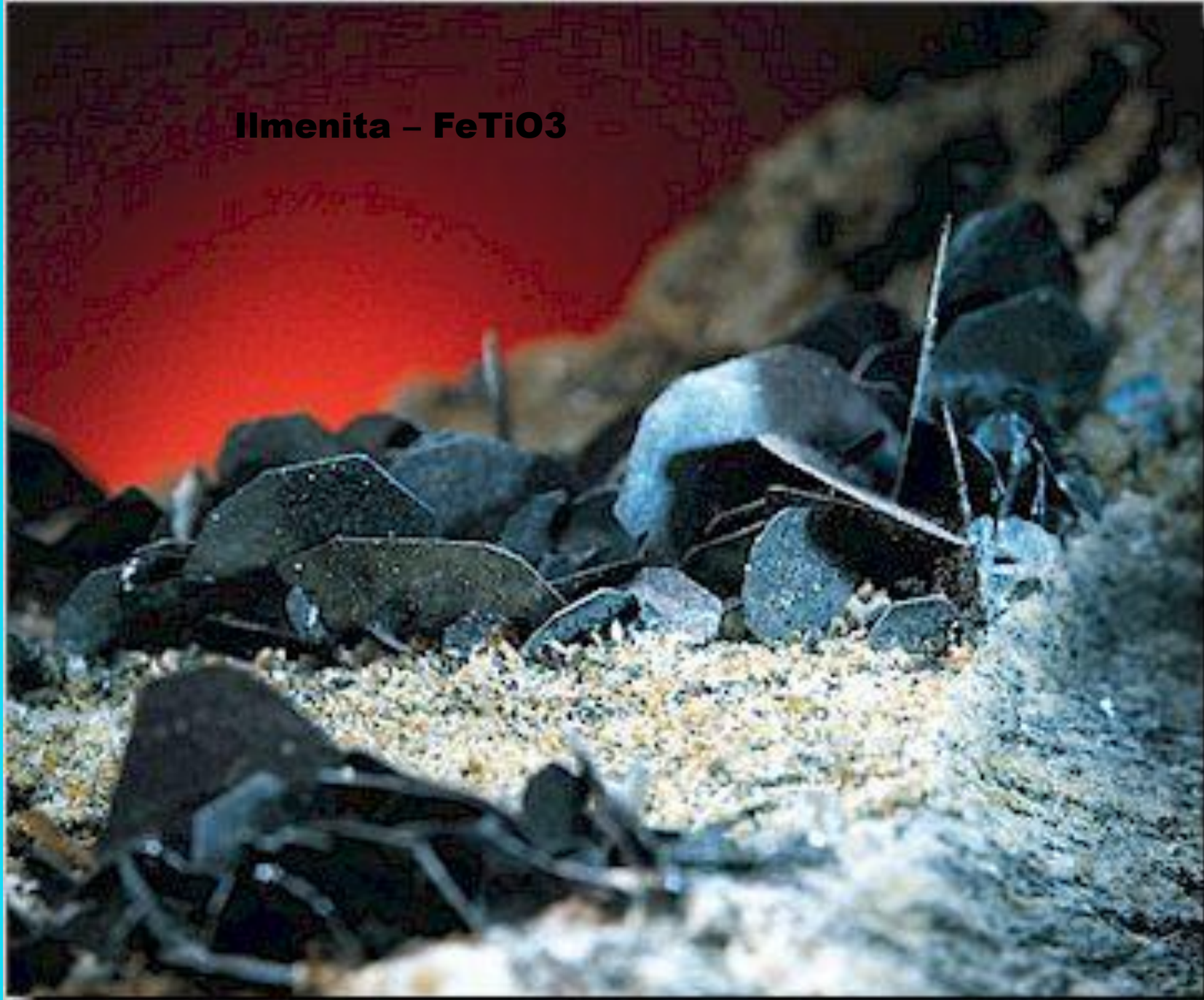


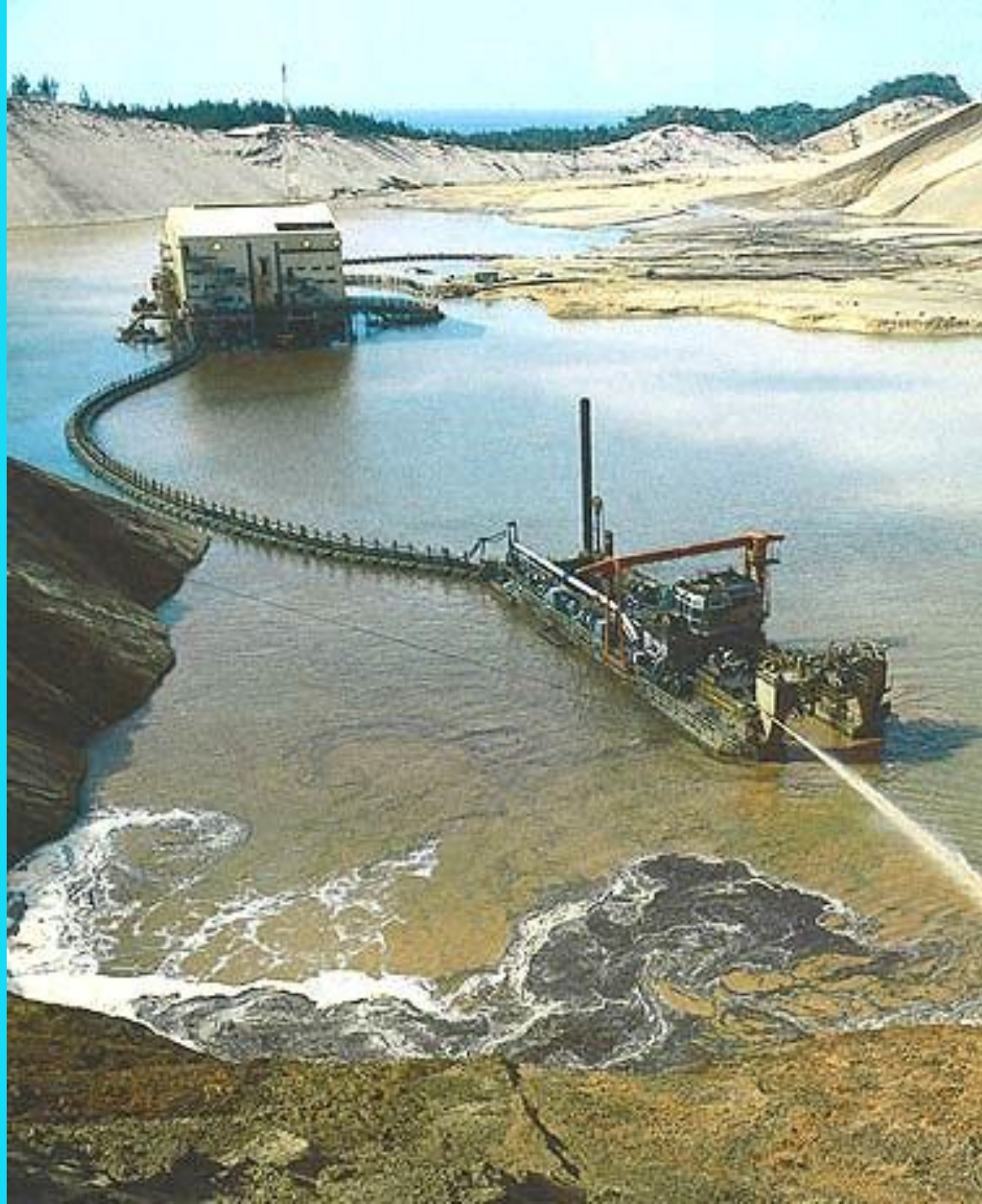
Coríndon – Al_2O_3



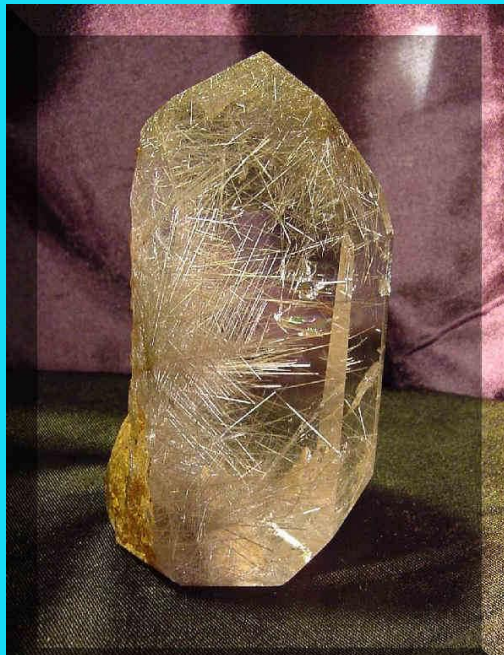
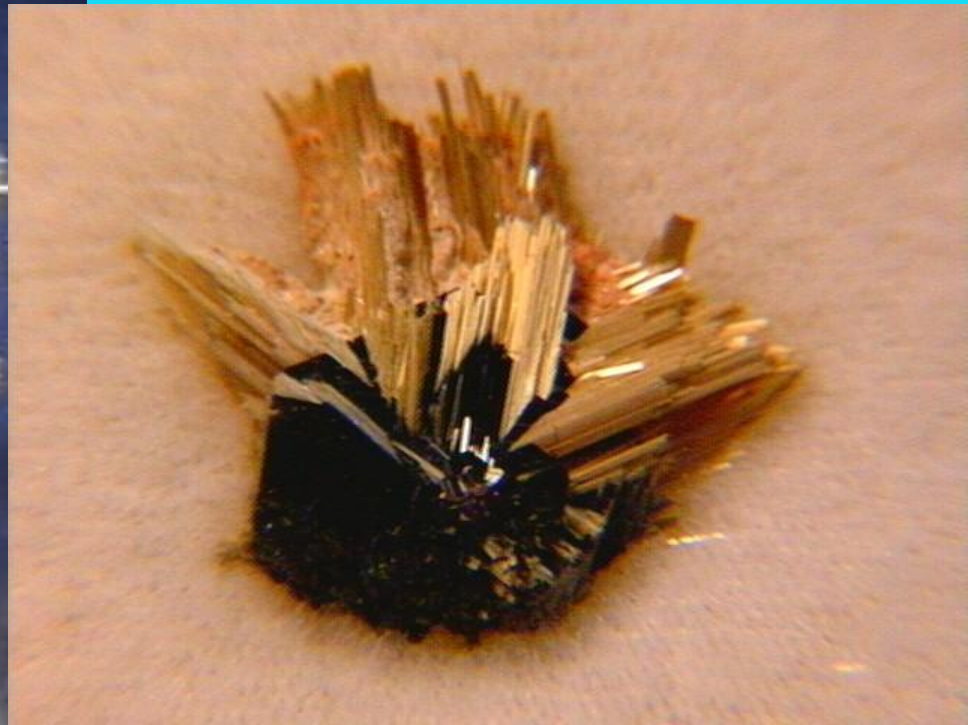


Ilmenita – FeTiO_3



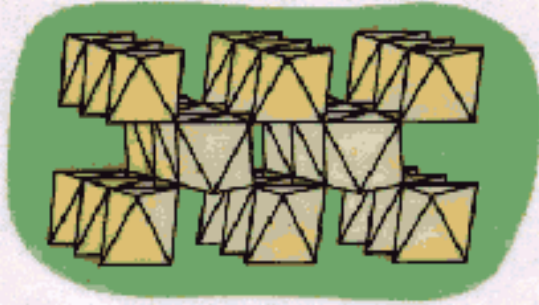


Rutilo – TiO_2



PYROLUSITE

MnO_2

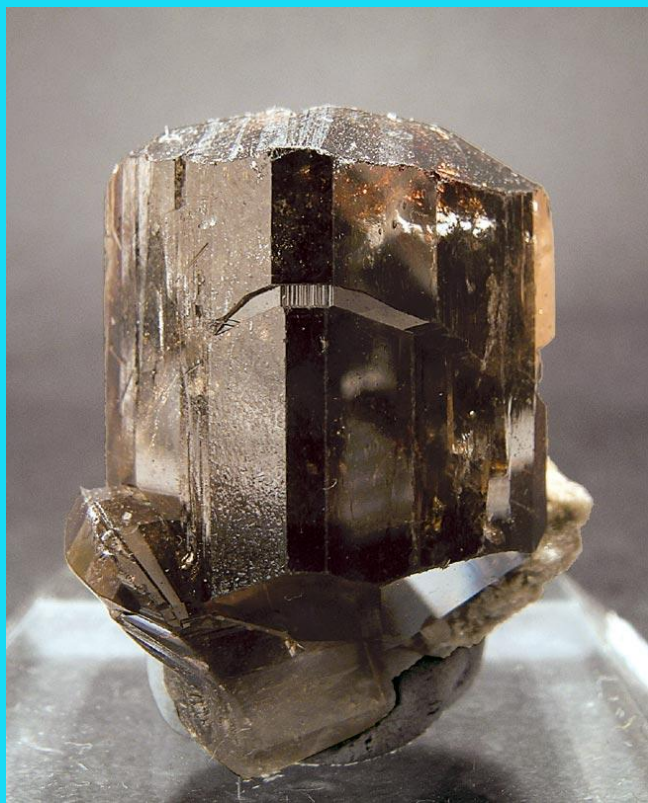


CASSITERITE



SnO_2

2.85ct \$171





URANINITA

Espinélio - MgAl_2O_4



TERRES AUSTRALES ET ANTARCTIQUES FRANÇAISES

1,00 F
0,15 €

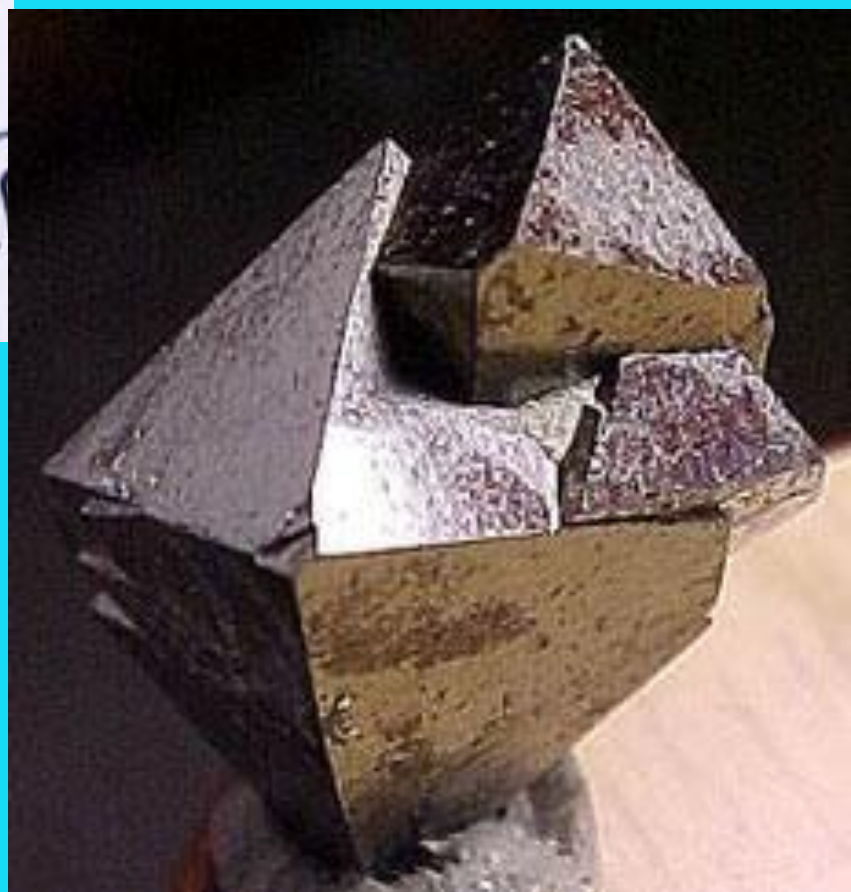


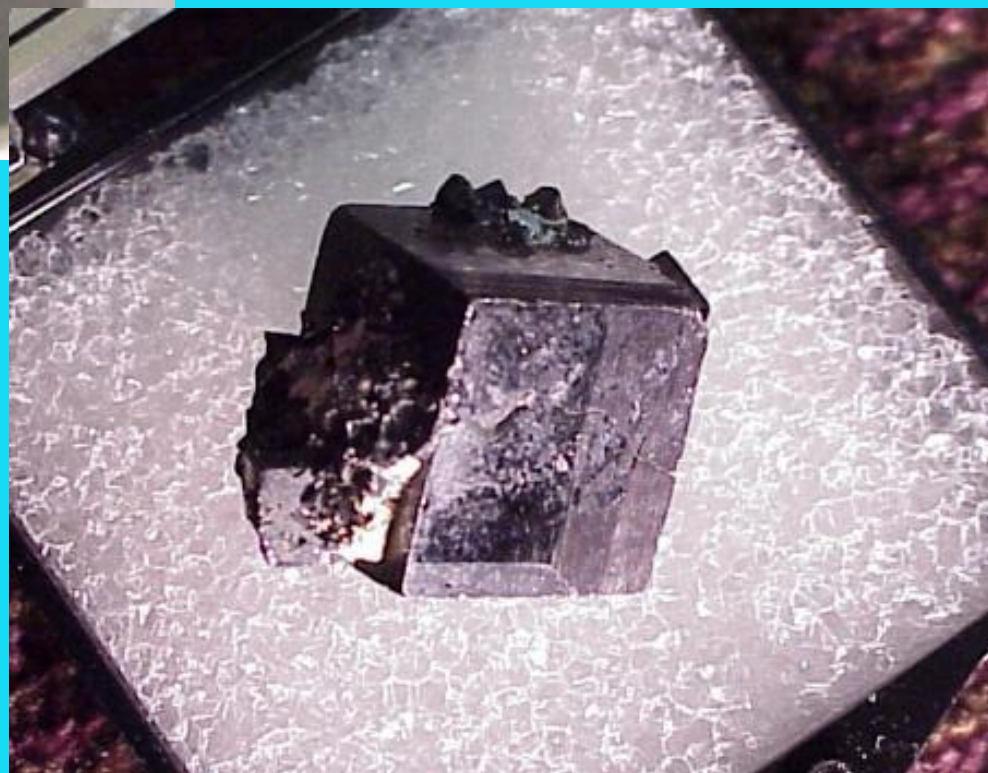
RF
POSTES 2001

ITVF

MAGNET

FRANCE







Chromite

Copyright © 2005 Calvin J. Hamilton



CHRYSOBERYL



BeAl_2O_3

1.15ct \$115





the
**Mineralogical
Record**

Volume Fourteen, Number Four
July-August 1983 \$4.00





Calcite

extraLapis English No. 4:
The Mineral With the Most Forms



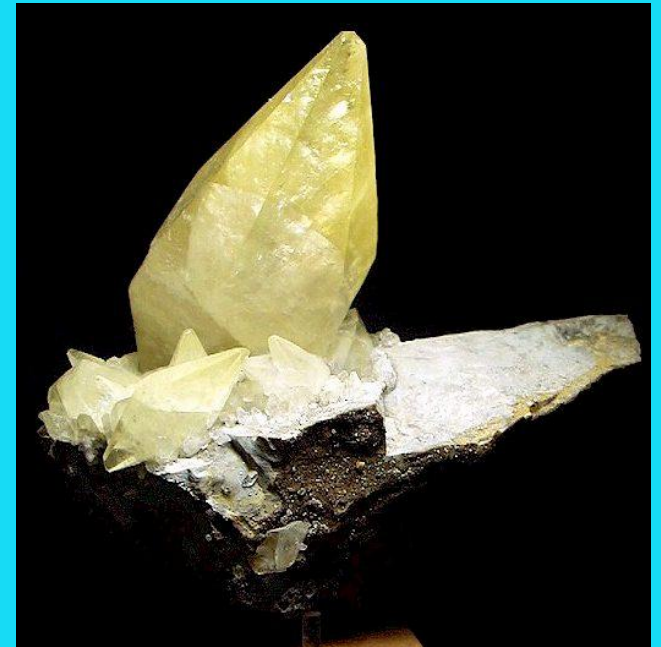
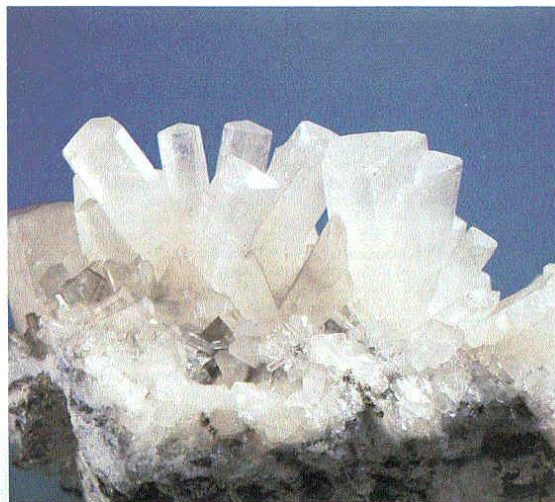
Calcite, Aragonite & Co:
The Calcium Carbonates
Calcite Likes to Lie:
Pseudomorphs
René Just Haüy and the
Broken Crystal
Under the UV Lamp:
Calcite Fluorescence



A Lucky Break for
Polarization: The Optical
Properties of Calcite
Top Calcite Localities
The Bizarre World of
Limestone Caves
The Art of Cleaning
Calcite & Aragonite



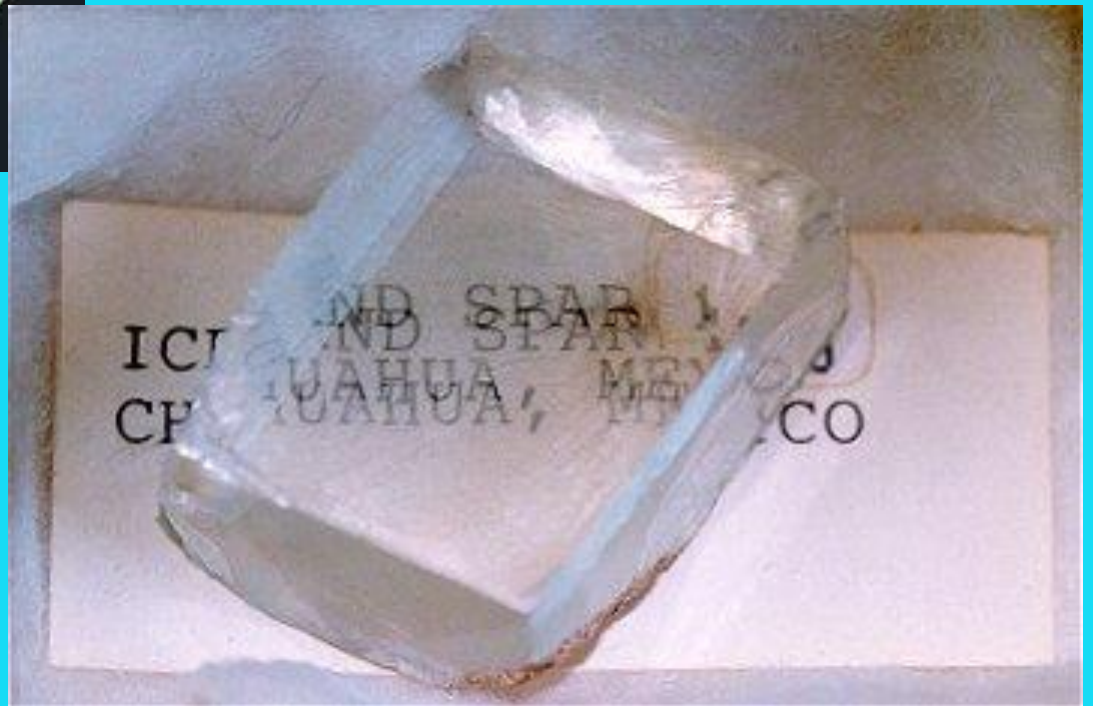
Calcite
CaCO₃

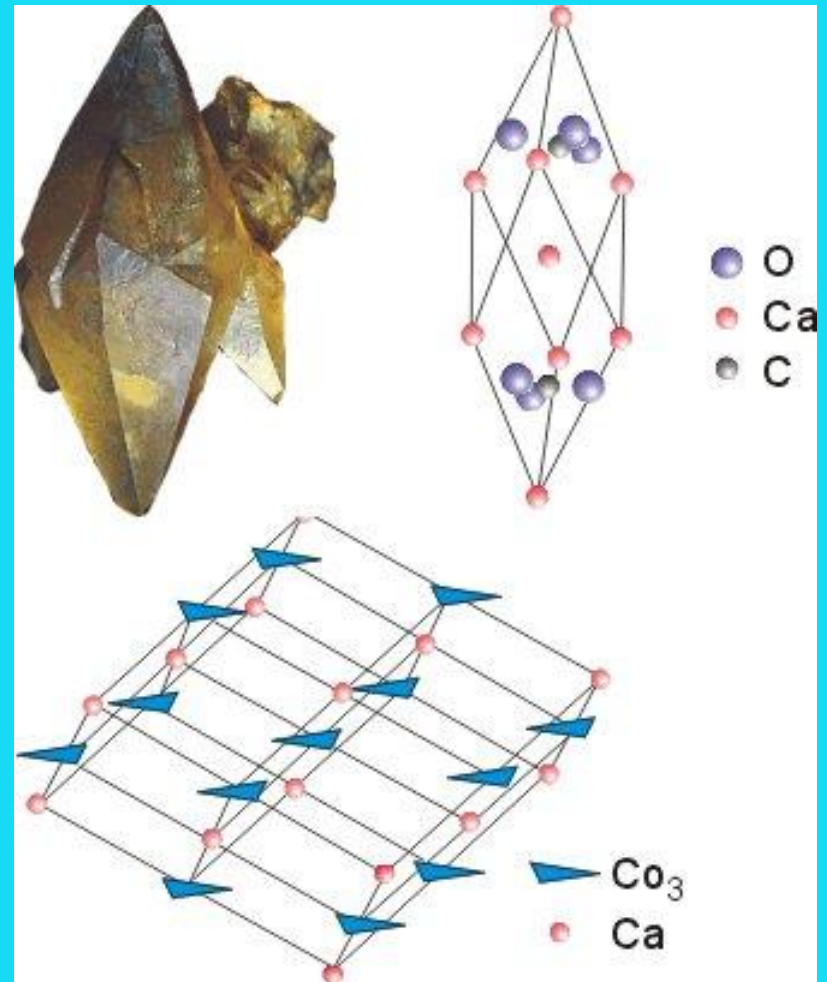
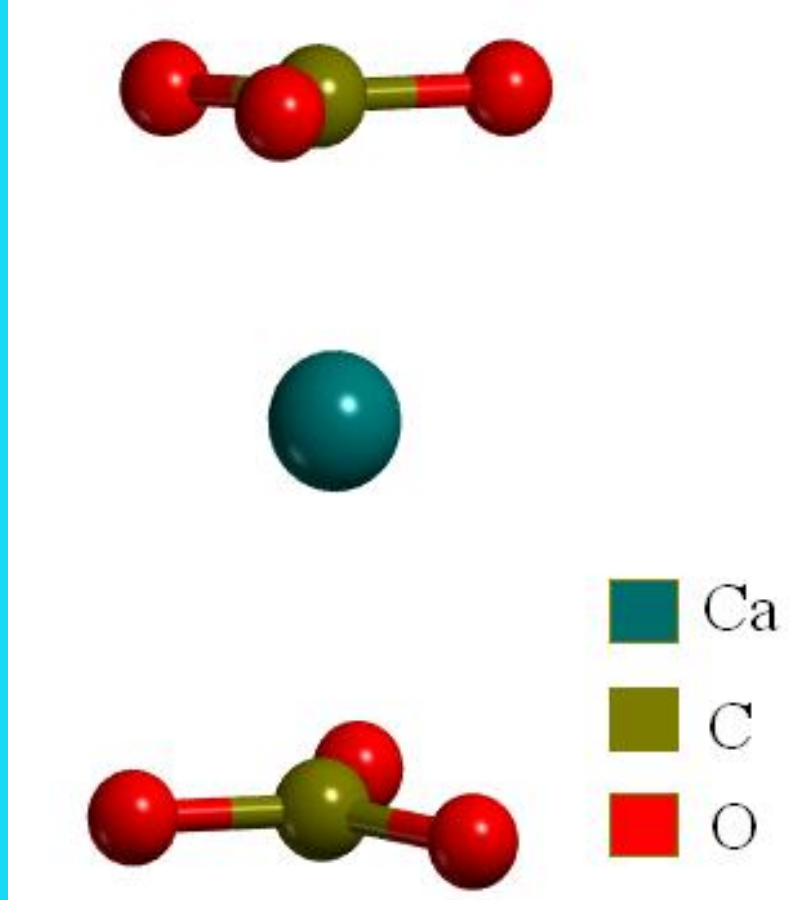


Calcite #R 024

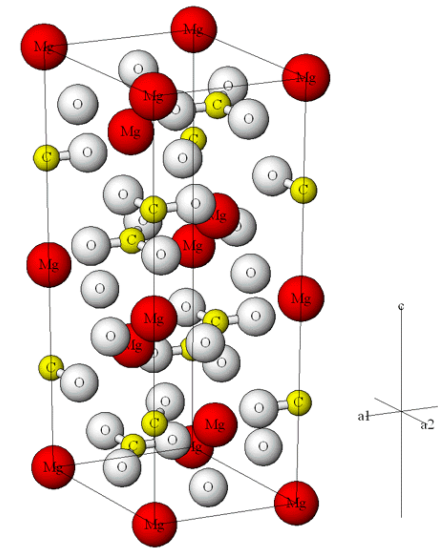
Red - Blue - Green - Orange







Magnesita



14.2.1 Dolomite Group (Trigonal: $R\bar{3}2$)

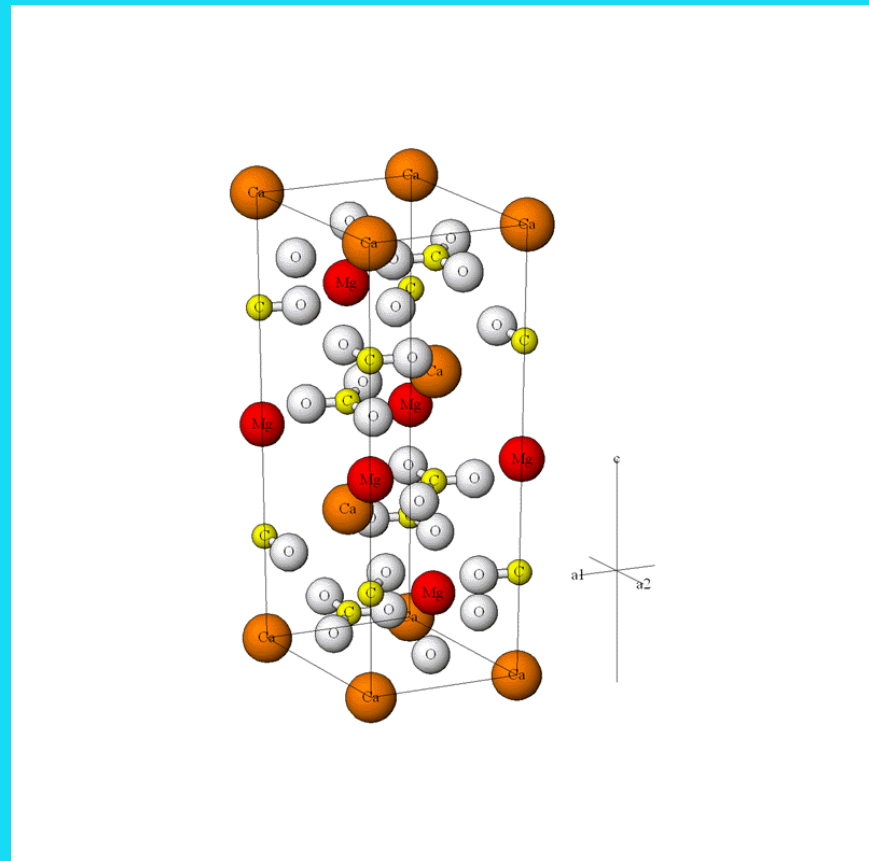
14.2.1.1 Dolomite $\text{CaMg}(\text{CO}_3)_2$ $R\bar{3}2$

14.2.1.2 Ankerite $\text{Ca}(\text{Fe}^{++}, \text{Mg}, \text{Mn})(\text{CO}_3)_2$ $R\bar{3}2$

14.2.1.3 Kutnohorite $\text{Ca}(\text{Mn}, \text{Mg}, \text{Fe}^{++})(\text{CO}_3)_2$ $R\bar{3}2$

14.2.1.4 Minrecordite $\text{CaZn}(\text{CO}_3)_2$ $R\bar{3}2$

14.2.2



14.1.3 Aragonite Group (Orthorhombic: $Pmcn$)

14.1.3.1 Aragonite $CaCO_3$ $Pmcn$ 2/m 2/m 2/m

14.1.3.2 Witherite $BaCO_3$ $Pmcn$ 2/m 2/m 2/m

14.1.3.3 Strontianite $SrCO_3$ $Pmcn$ 2/m 2/m 2/m

14.1.3.4 Cerussite $PbCO_3$ $Pmcn$ 2/m 2/m 2/m



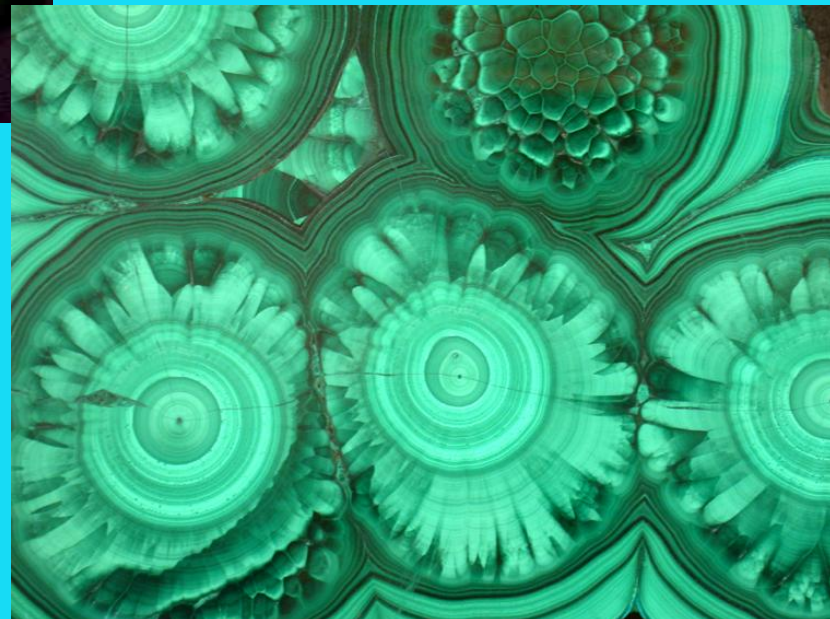


16a.3.2 Malachite Group

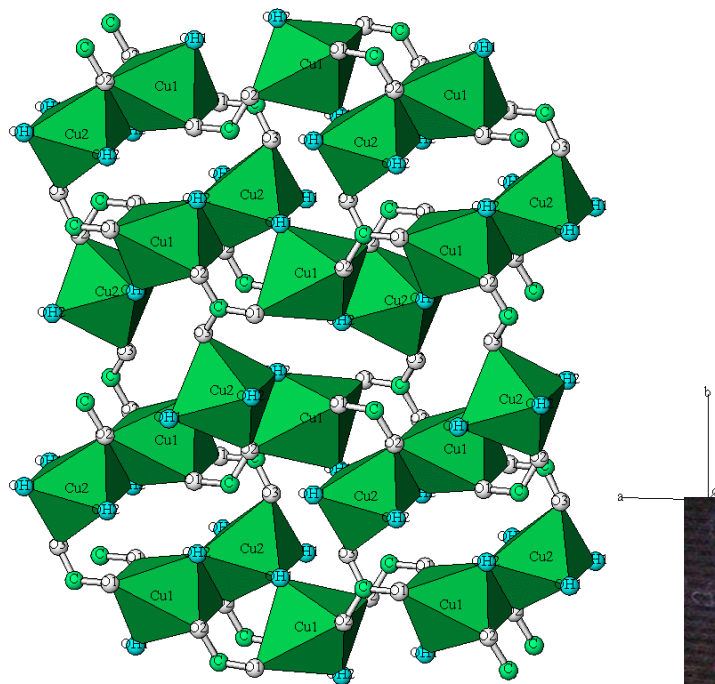
16a.3.2.1 Malachite $\text{Cu}_2(\text{CO}_3)(\text{OH})_2$ $P 2_1/a 2/m$

16a.3.2.2 Nullaginite $\text{Ni}_2(\text{CO}_3)(\text{OH})_2$ $P 2_1/m, P 2_1$ Mono

16a.3.2.3 Pokrovskite $\text{Mg}_2(\text{CO}_3)(\text{OH})_2 \cdot 0.5(\text{H}_2\text{O})$ $P 2_1/a 2/m$









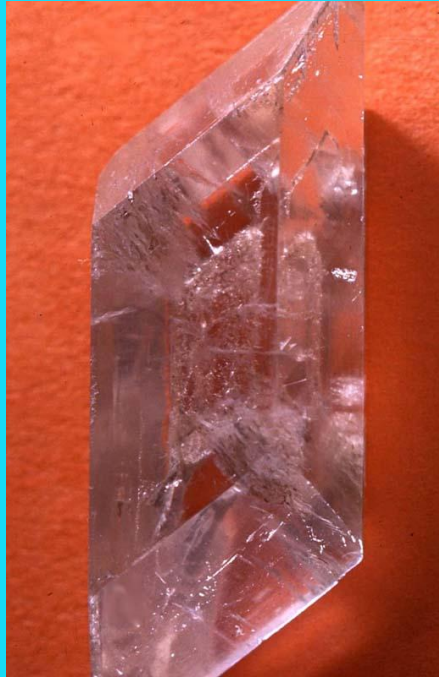


29.6.3.1 Gypsum $\text{CaSO}_4 \cdot 2(\text{H}_2\text{O})$ $A2/a$ $2/m$

29.6.4

29.6.4.1 Sanderite $\text{MgSO}_4 \cdot 2(\text{H}_2\text{O})$ Mono ? Mono

29.6.5









FOSFATOS

Apatite
 $\text{Ca}_5(\text{PO}_4)\text{F}$



Cal Apatite Plus 270 tabs



Cal Apatite Plus provides a unique combination of the same calcium-rich MCHC found in original Cal Apatite®, but with key nutritional factors added to help maintain healthy bone density.

Features ipriflavone, a unique isoflavone derivative that helps support healthy bone metabolism.

Supplies vitamin D, an essential nutrient for the maintenance of healthy bones that stimulates intestinal calcium absorption and helps to regulate calcium and phosphorus homeostasis in the body.

THREE TABLETS SUPPLY:

Microcrystalline Hydroxyapatite Concentrate (MCHC)† 1,500 mg
 Vitamin D (as cholecalciferol) 600 IU
 Calcium (as MCHC and dicalcium phosphate) 660 mg
 Phosphorus (as MCHC and dicalcium phosphate) 423 mg
 Ipriflavone 150 mg

Recommendations: Up to six tablets daily.

Price: \$65.00

Quantity



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Unit

SKU

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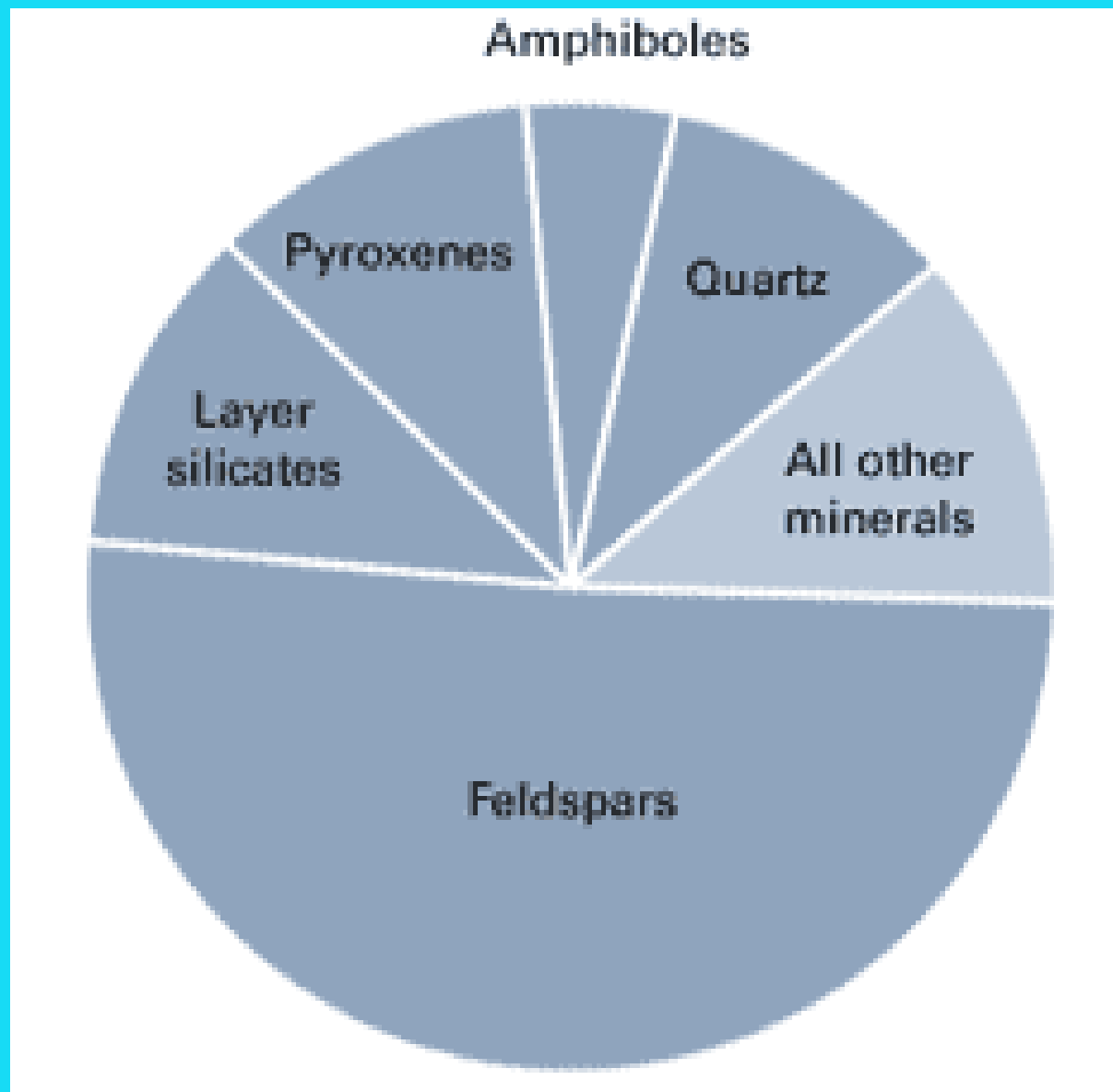
Exercise Equipment

Dina's Chocolate

Anemia

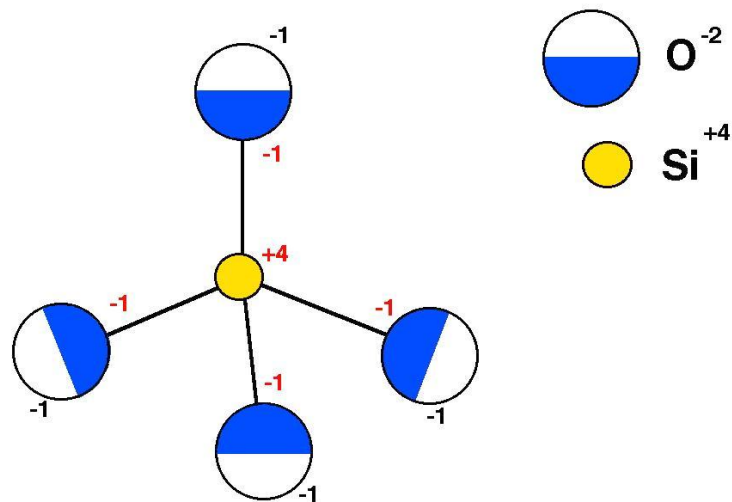
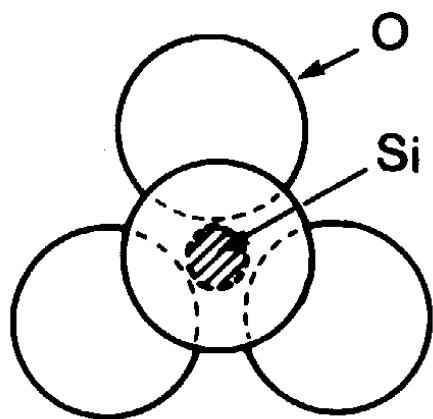
Appetite

Blood Pressure

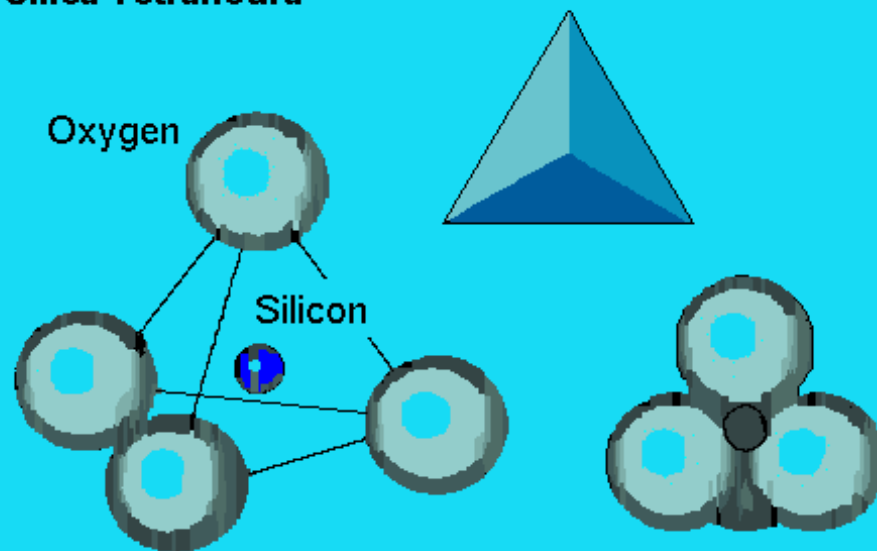


Minerais comuns da crosta terrestre (continental e oceânica)

Plagioclásio	39%	Micas	5%
FK	12%	Argilominerais	5%
Quartzo	12%	Outros silicatos	3%
Piroxênio	11%	Não silicatos	8%
Anfibólio	5%		



Silica Tetrahedra



Subgroup*	Structure	Si:O Ratio
<u>Nesosilicates</u>	single tetrahedrons (no oxygens shared between neighboring tetrahedra) joined by bonds with other cations	1:4
<u>Sorosilicates</u>	two neighboring tetrahedra share one point	2:7
<u>Cyclosilicates</u>	all tetrahedra share 2 oxygens, each one with a different neighbor, building up 3, 4, 6 or 12 tetrahedra into a ring structure	1:3
<u>Inosilicates Single Chain</u>	all tetrahedra share 2 oxygens, each one with a different neighbor, building a chain structure	1:3
<u>Inosilicates Double Chain</u>	alternate tetrahedra share 2 then 3 oxygens, each one with a different neighbor, building a side-by-side double chain structure	4:11
<u>Phyllosilicates</u>	each tetrahedron shares 3 basal oxygens, each one with a different neighbor, building a sheet structure	2:5
<u>Tectosilicates</u>	each tetrahedron shares all 4 oxygens, each one with a different neighbor, building a 3-D framework structure	1:2

51.3 Nesosilicates Nesosilicate Insular SiO_4 Groups Only with all cations in octahedral [6] coordination

51.3.1 Olivine group

51.3.1.0 Olivine* $(\text{Mg,Fe})_2\text{SiO}_4$ Pbnm 2/m 2/m 2/m

51.3.1.1 Fayalite $\text{Fe}^{++}_2\text{SiO}_4$ Pbnm 2/m 2/m 2/m

51.3.1.2 Forsterite Mg_2SiO_4 Pbnm 2/m 2/m 2/m

51.3.1.3 Liebenbergite $(\text{Ni,Mg})_2\text{SiO}_4$ Pbnm 2/m 2/m 2/m

51.3.1.4 Tephroite Mn_2SiO_4 P nma 2/m 2/m 2/m

51.3.1.5 Laihunite $\text{Fe}^{++}\text{Fe}^{+++}_2(\text{SiO}_4)_2$ $\text{P } 2_1/b$ 2/m

51.3.2 Monticellite - Kirschsteinite series

51.3.2.1 Monticellite CaMgSiO_4 P nma 2/m 2/m 2/m

51.3.2.2 Kirschsteinite $\text{CaFe}^{++}_2\text{SiO}_4$ Pbnm 2/m 2/m 2/m

51.3.2.3 Glaucocroite CaMnSiO_4 Pbnm 2/m 2/m 2/m

51.3.3

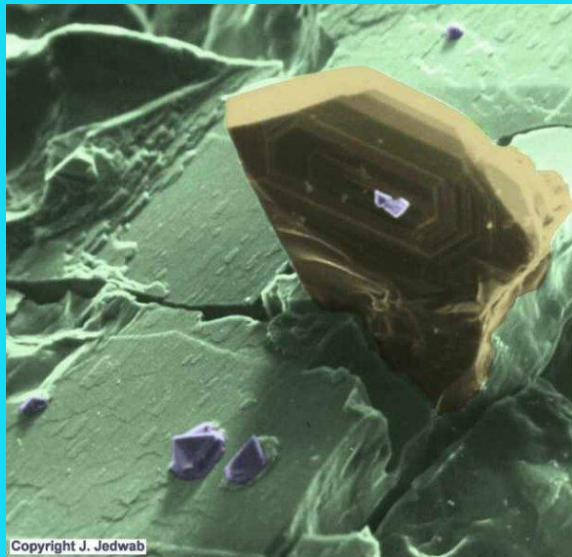
51.3.3.1 Ringwoodite Mg_2SiO_4 $\text{F d}3m$ 4/m $\bar{3}$ 2/m

51.3.4

51.3.4.1 Wadsleyite $(\text{Mg,Fe}^{++})_2\text{SiO}_4$ $\text{I}2/m$ 2/m



Olivina



Copyright J. Jedwab



Granada



Garnet



Alaska Garnet Mining & Manufacturing Corporation

*The First All-Woman Mining
Corporation in the United States*



51.5.2 Zircon group

51.5.2.1 Zircon ZrSiO_4 I $4_1/\text{and}$ $4/m$ $2/m$ $2/m$

51.5.2.2 Hafnon HfSiO_4 I $4_1/\text{and}$ $4/m$ $2/m$ $2/m$

51.5.2.3 Thorite ThSiO_4 I $4_1/\text{and}$ $4/m$ $2/m$ $2/m$

51.5.2.4 Coffinite $\text{U}(\text{SiO}_4)_{1-x}(\text{OH})_{4x}$ I $4_1/\text{and}$ $4/m$ $2/m$ $2/m$

51.5.2.5 Thorogummite $\text{Th}(\text{SiO}_4)_{1-x}(\text{OH})_{4x}$ I $4_1/\text{and}$ $4/m$ $2/m$ $2/m$

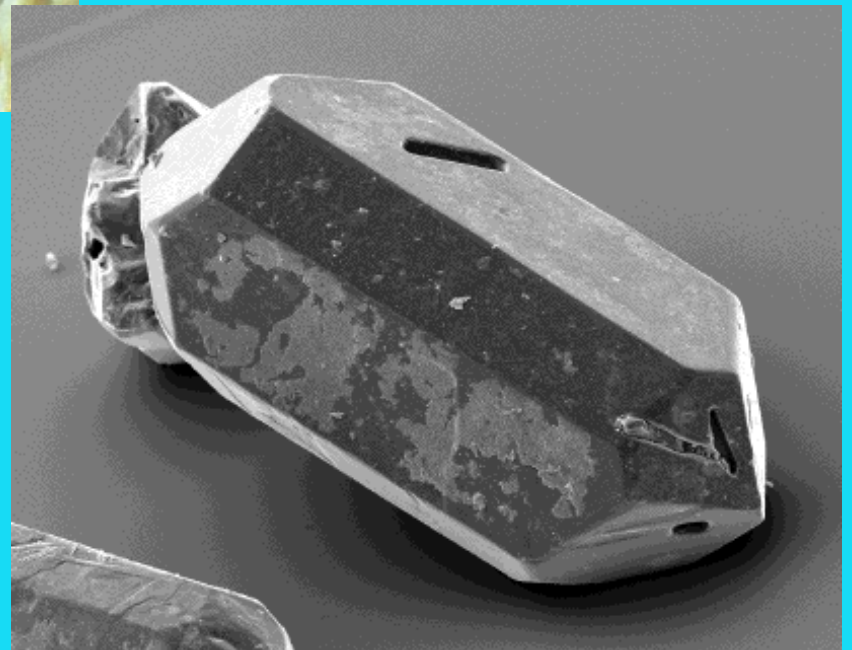


Zircon Penn Maryland Materials Quarry

ZIRCÃO



ZIRCÃO



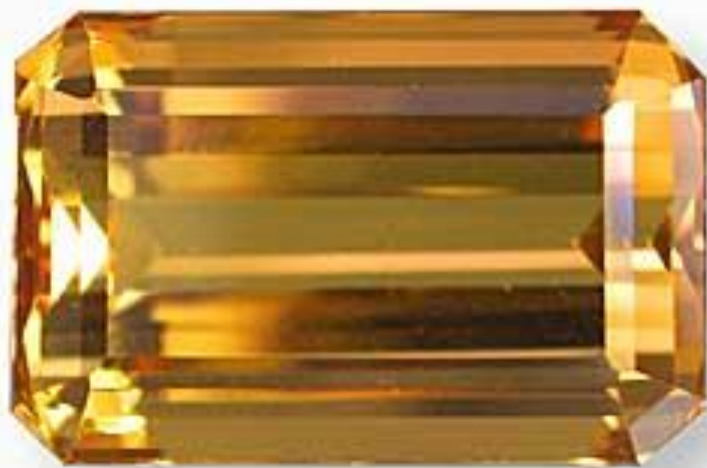
estauroлита





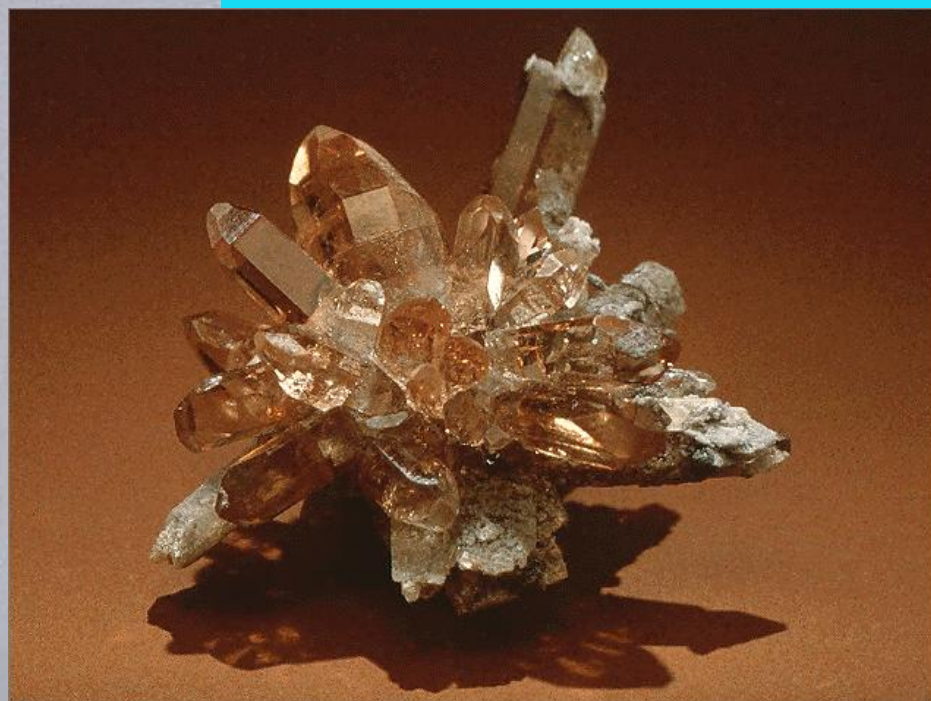
Topázio





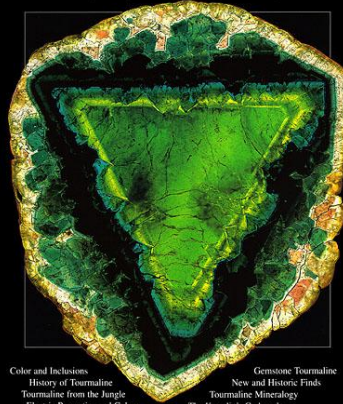
Topázio





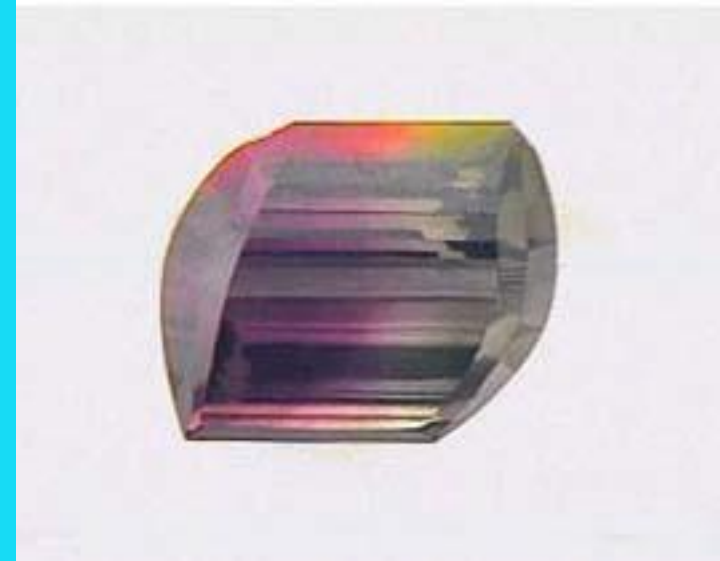
Tourmaline

extraLapis English No. 3: A Gemstone Spectrum



Color and Inclusions
History of Tourmaline
Tourmaline from the Jungle
Electric Properties and Colors
Phenomena and Theories
Localities from the Americas to Europe and Africa to Australia

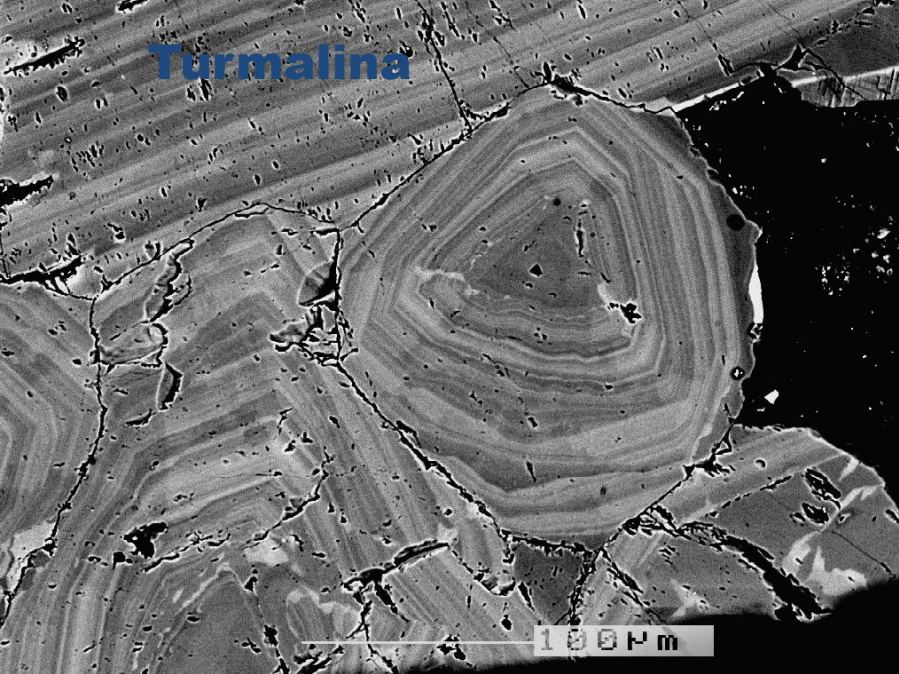
Gemstone Tourmaline
New and Historic Finds
Tourmaline Mineralogy
The Kremlin's Carbuncle
Research and Discoveries



Turmalina



Turmalina



Ask Kate is Now Open!
email Kate your beauty dilemma: kate@avenueyou.com

Pre-Order New DevaCurl Power & DevaCurl Power Hair!

Cricket

Email this to a friend

List Price	Your Price	Qty
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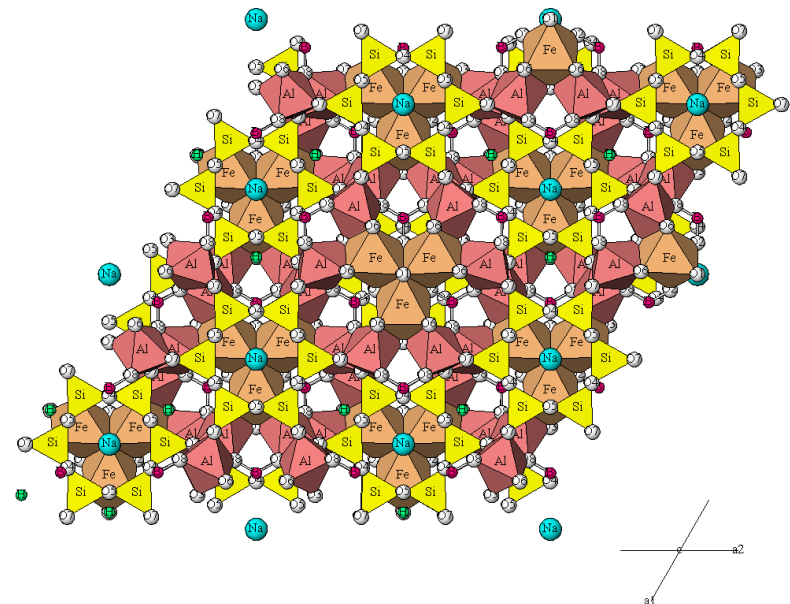
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- 1.) DevaCurl One Condition
- 2.) DevaCurl Angell
- 3.) DevaCurl No-Poo
- 4.) Kinky Bleaching Powder
- 5.) Complete List of Classic Nail Colors For Quick and Easy Shopping!
- 6.) KissMe Mascara
- 7.) OPI Lip Stick
- 8.) DevaCurl Moistur Right
- 9.) OPI Retired and Discontinued Colors
- 10.) Complete List of Essie Colors For Quick And Easy Shopping
- 11.) DevaCurl Low-Poo
- 12.) OPI Lip Liner
- 13.) DevaCurl Set It Free Finishing Mist
- 14.) Bella il Fiore Roller Ball Eye Shadows
- 15.) Brights by OPI
- 16.) Vivitone Cream Hair Color
- 17.) - Japanese Nail Lacquers
- 18.) Bliss Poetic Cosmetics Fat Girl Slim
- 19.) DevaCurl B'Leave-In
- 20.) Divinity Lipgloss

Cricket Tourmaline Air Flow 5175T

- 1875 Watts
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5cm

B



Berilo

BERYL



Berilo



Beryl

And Its Color Varieties

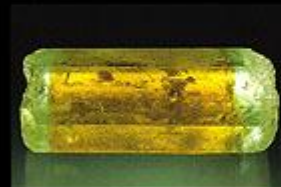


Aquamarine, Heliodor, Morganite
Goshenite, Emerald, and Red Beryl

Beryl

And Its Color Varieties:

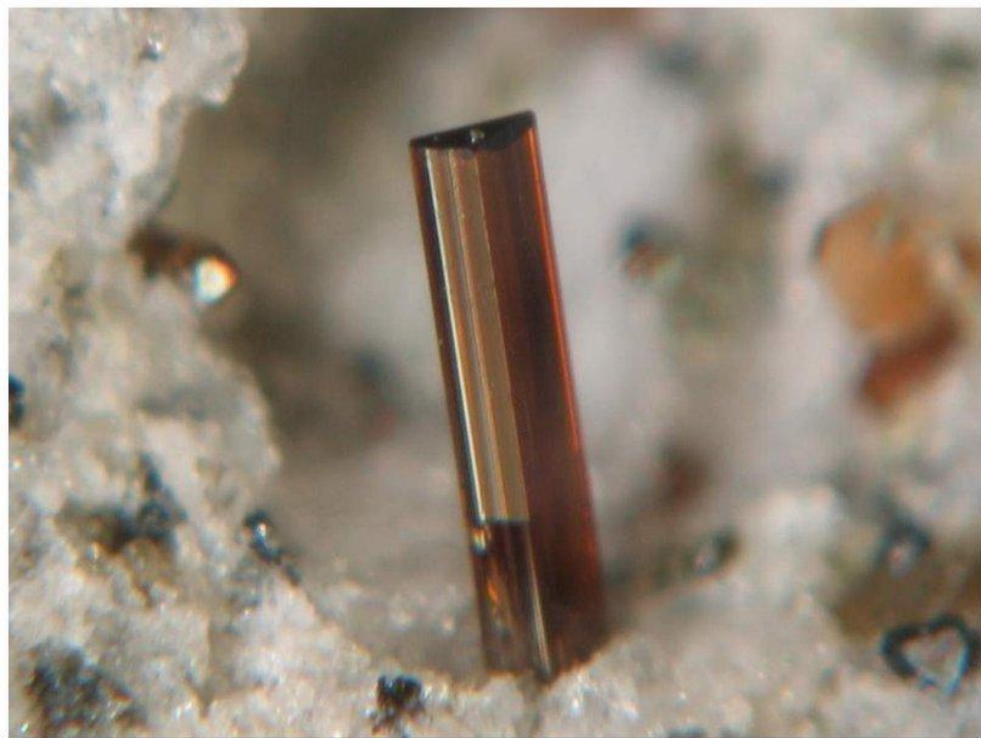
Aquamarine, Heliodor, Morganite, Goshenite, Emerald, and Red Beryl



The colorful varieties of beryl, from clear goshenite to vibrant emerald to serene aquamarine, have been inspiring scientists, mystics and poets for millennia. Found in a range of shapes, sizes and colors, beryl is as diverse as the Earth in which it forms. Today, much is known and much remains unknown about the gemstone, mineral specimen and strategic ore that is beryl.



Beryl And Its Color Varieties
Lapis International, LLC
East Hampton, Connecticut, USA
ISBN 0-971537-16-X



PIROXÊNIOS



Anfibólio

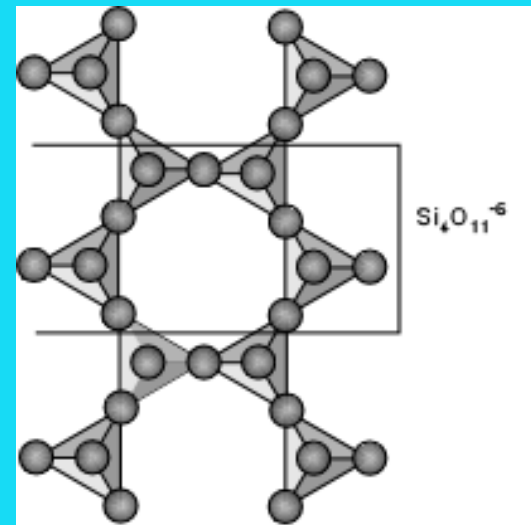
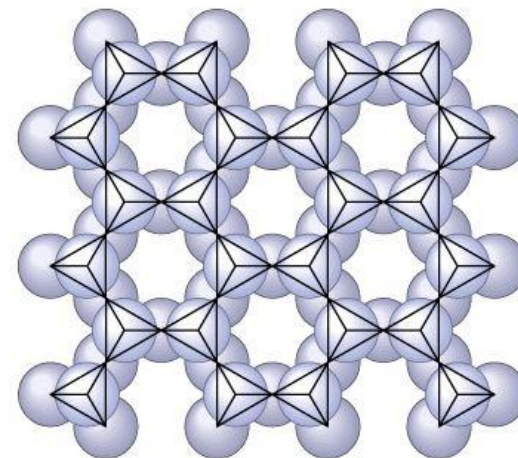




photo: J. Buss



Sheet Silicate
 $(\text{Si,Al})_4\text{O}_{10}$

Muscovite: $\text{K}_2\text{Al}_4[\text{Si}_6\text{Al}_2\text{O}_{20}](\text{OH,F})_4$



Biotite





lepidolita

flogopita



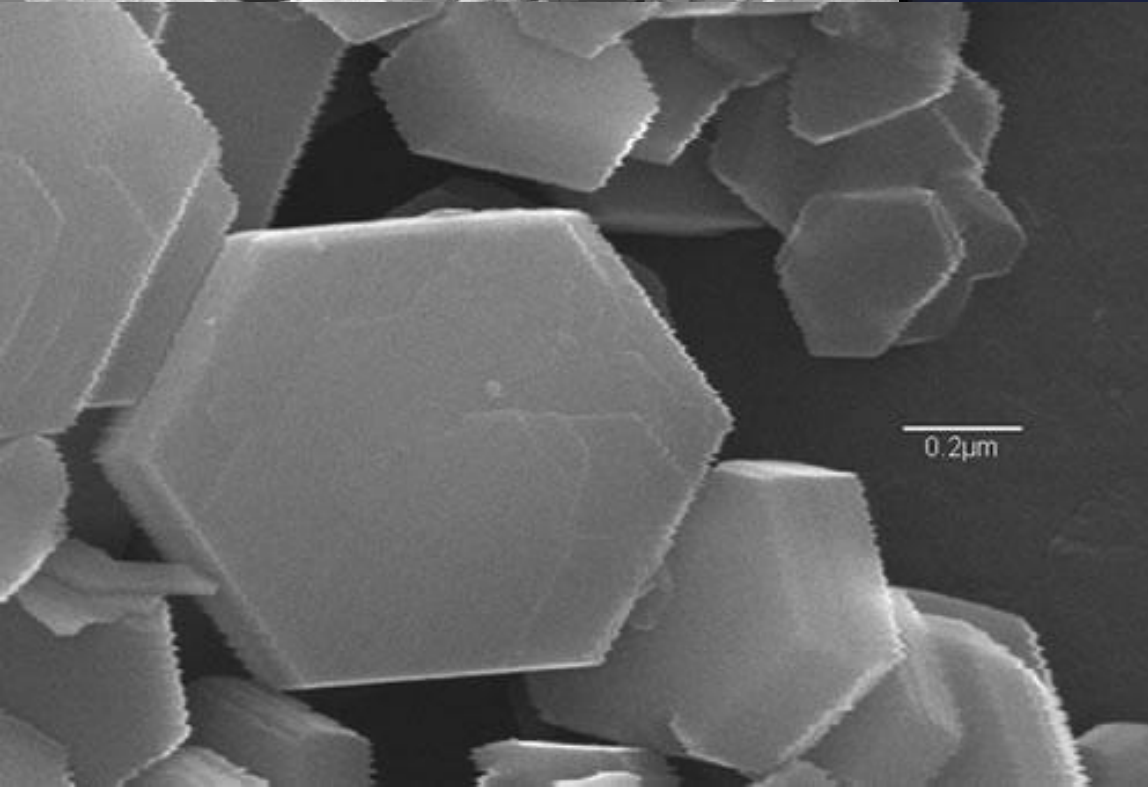
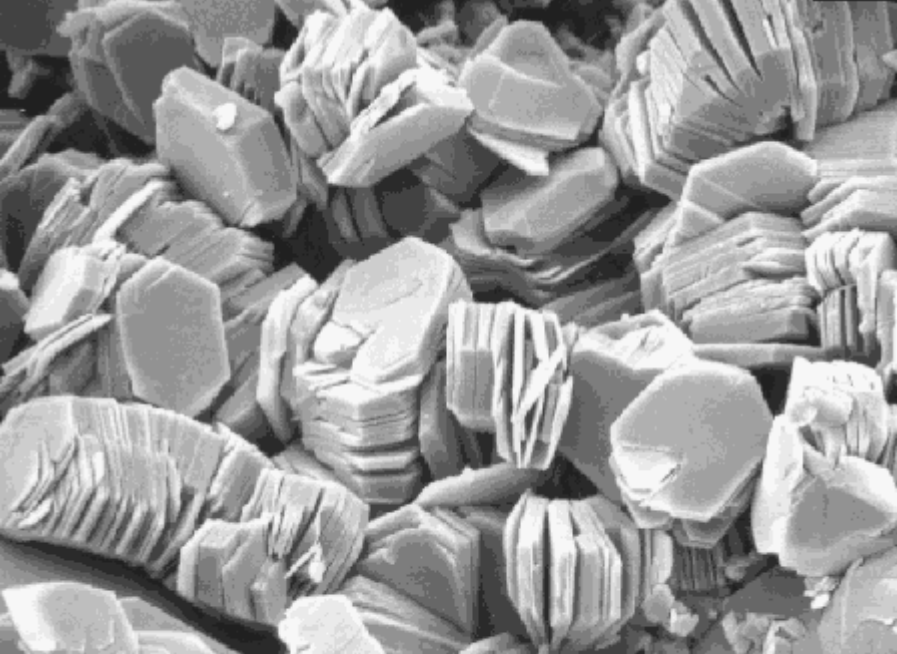
flogopita





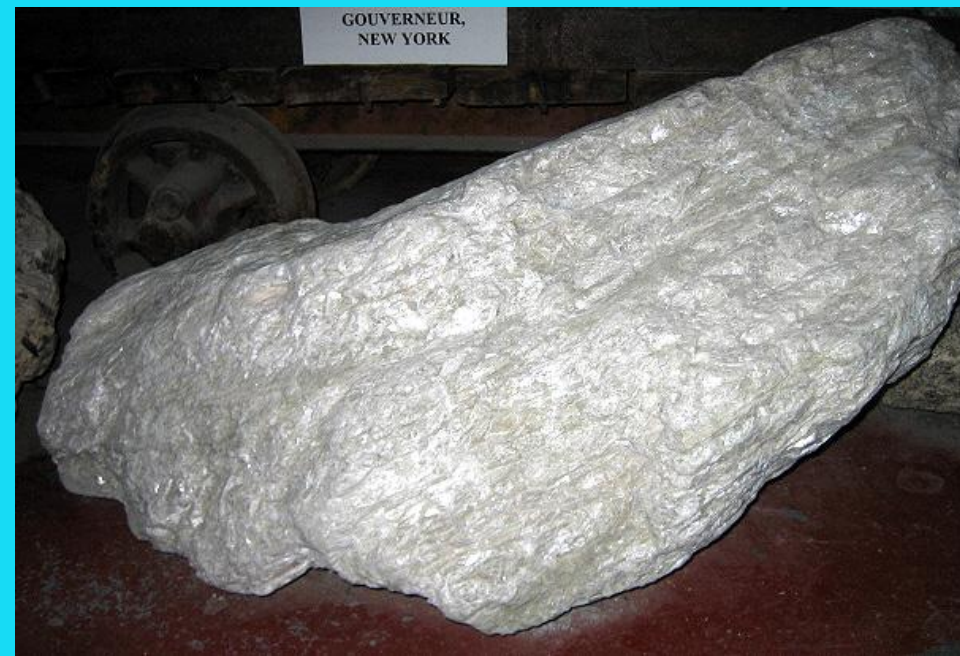
serpentina





Caulinita





Talco



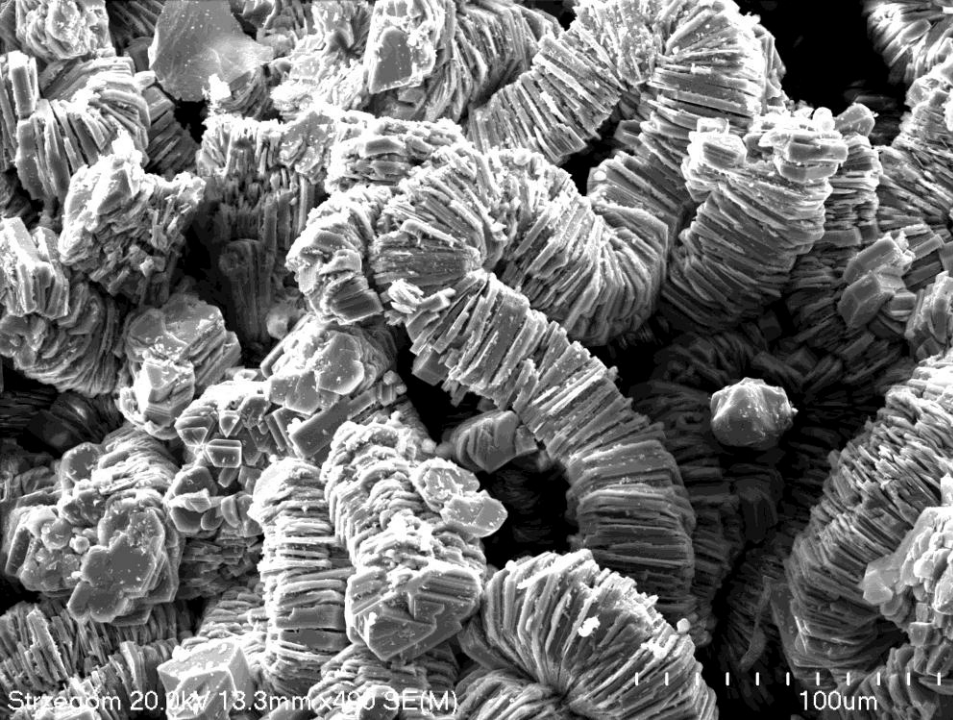
000051 10KV X4.00K 7.5um

#33

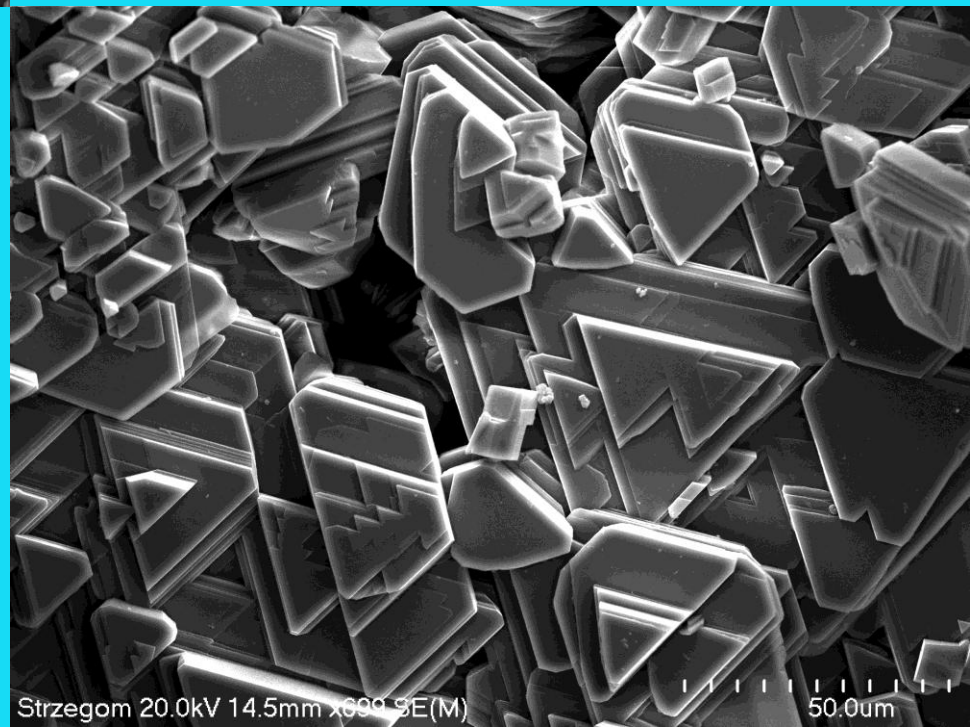


Chlorite





Clorita







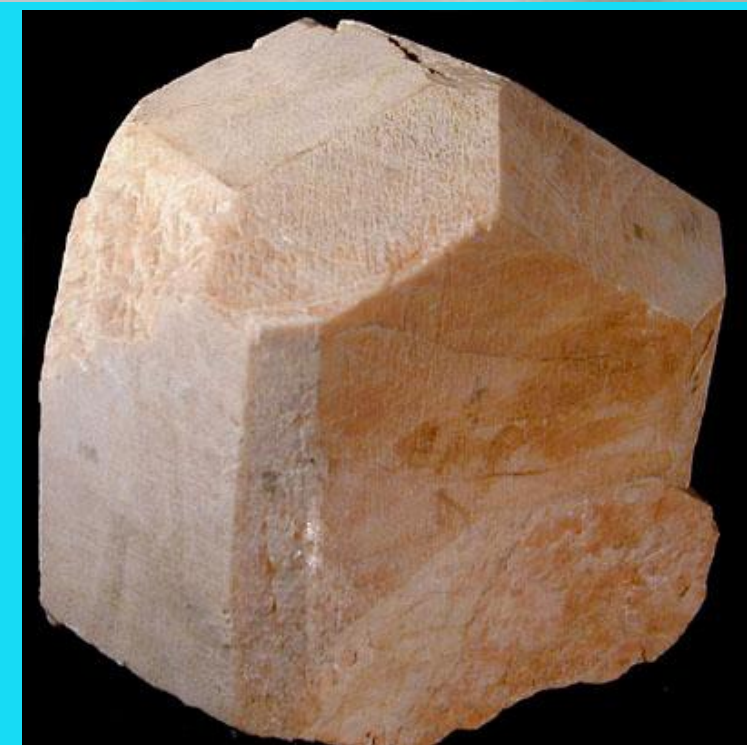
FELDSPAR	FORMULA	CATION CHARGE	CATION SIZE	SUBSTITUTIONS
ORTHOCLASE	KAlSi_3O_8	K^{+1}	$1.33 \text{ \AA}$	Charges ok, but size difference too large for substitution Sizes ok, but charges must be balanced for substitution. Done with Al and Si substitution
SODIUM PLAGIOCLASE	$\text{NaAlSi}_3\text{O}_8$	Na^{+1}	$0.95 \text{ \AA}$	
CALCIUM PLAGIOCLASE	$\text{CaAl}_2\text{Si}_2\text{O}_8$	Ca^{+2}	$0.99 \text{ \AA}$	



Feldspato



Feldspato





Nefelina



Sodalita



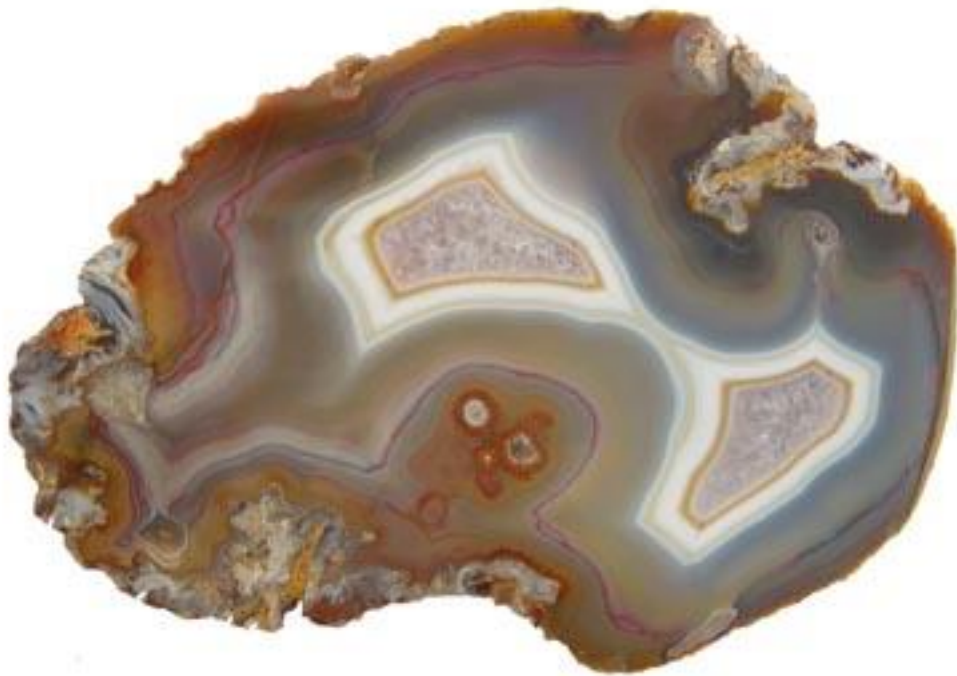


Quartzo





Quartzo



Quartzo

