



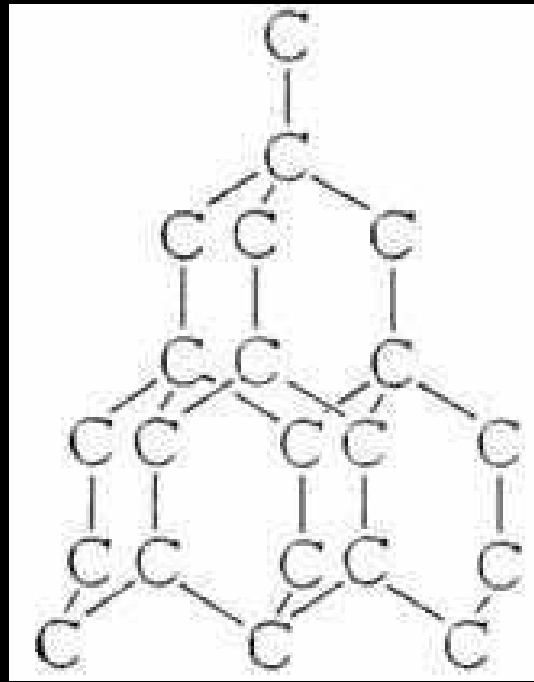
Ako zlepšiť drahokam?

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Chemie a technologie materiálu
pro restaurování-konzervování

Diamant

- Typ I – ✓ N
 - Ia – susediace
 - Iaa – párové
 - Iab – $4N+1$ voľné miesto
 - Ib – izolované
- Typ II – ✗ N
 - Iia – ✗ nečistoty
 - Iib – B



Diamant



- HPHT

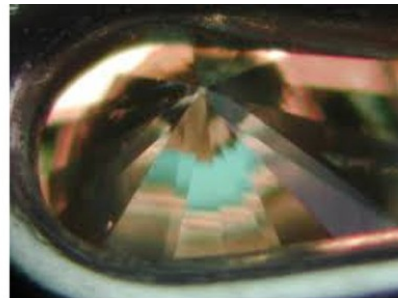
- poradie atómov a medzery
- odstránenie hnedo-žltej

- LPHT

- veľa nečistôt a trhlín
- grafitizácia

- Ožarovanie

- medzery a zmeny štruktúry
- umbrella effect



- Pokrytie farbou
- Vrtanie laserom, odstránenie nečistôt
- Vyplnenie – Pb, Bi-sklo



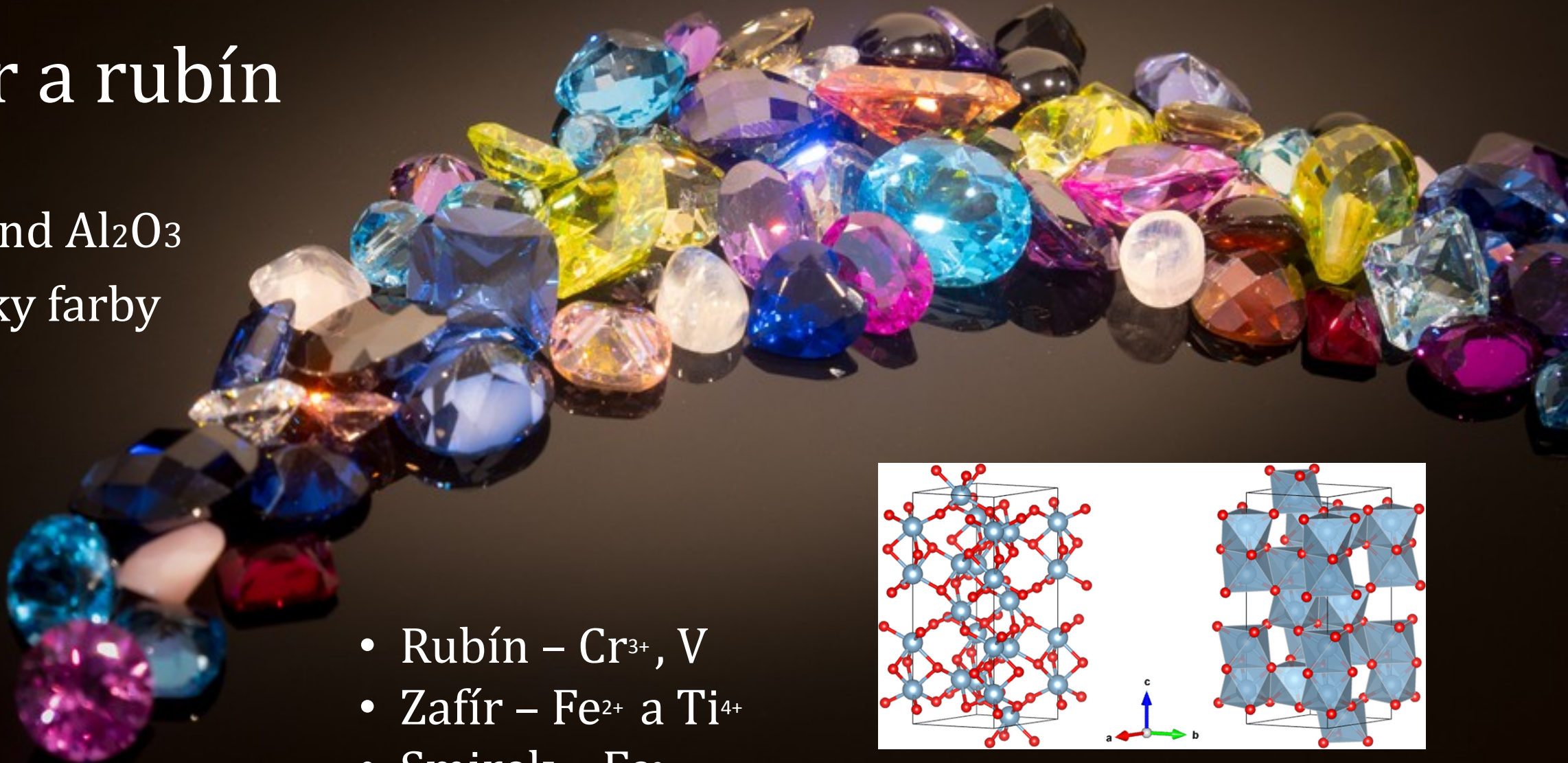
BEFORE



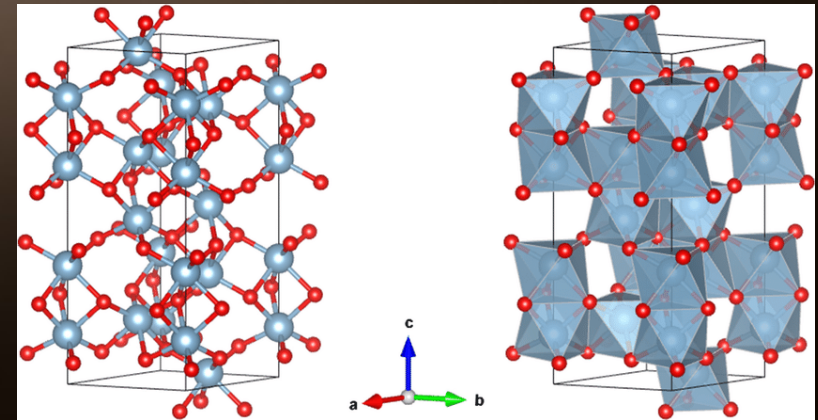
AFTER

Zafír a rubín

- Korund Al_2O_3
- Všetky farby

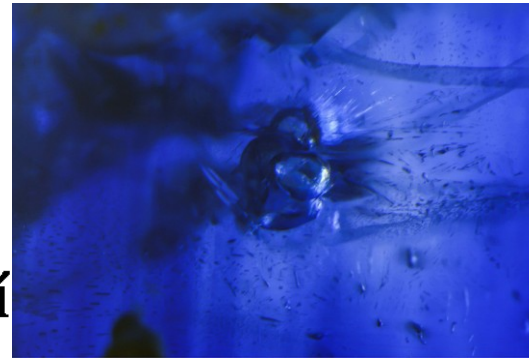
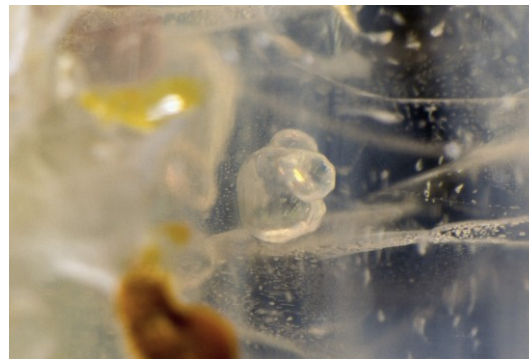


- Rubín – Cr^{3+} , V
- Zafír – Fe^{2+} a Ti^{4+}
- Smirek – Fe^{3+}



Zafír a rubín

- Žíhanie – 99% korundu
 - Zlepšenie farby
 - Vydrží do 2 000°C
 - Topenie a reabsorbpcia inklúzií
 - Pridanie Fe²⁺ a Ti⁴⁺
 - Riešenie trhlín a tekutých inklúzií

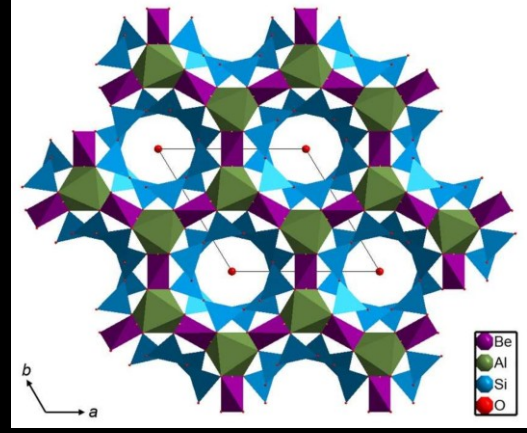


- Úprava difúziou
 - Be na biely zafír



Smaragd

- Beryl – $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}$
- Heliodor – Fe^{3+}
- Akvamarín – Fe^{3+} , Fe^{2+}
- Zelený – Fe^{3+} , Fe^{2+}
- Smaragd – Cr^{3+} , V^{3+}
- Pezzottaite – Mn^{2+}



- Gota de aceite – olej a polymery (Opticon)
- Žíhanie: heliodor → akvamarín

Cena drahokamov

- Farba
- Čistota
- Vel'kost'
- Rez
- Pôvod



Diamond Carat Weight	Price (Per Carat, Round Brilliant Cut)	Total Price	Diamond Example
0.50 carat	\$990 – \$5,000	\$495 – \$2,500	Click here for diamond from Blue Nile
1.0 carat	\$2,000 – \$14,000	\$2,000 – \$14,000	Click here for diamond from James Allen
1.50 carat	\$3,300 – \$24,000	\$4,400 – \$30,000	Click here for diamond from Blue Nile
2.0 carat	\$4,200 – \$29,000	\$8,400 – \$58,000	Click here for diamond from James Allen
3.0 carat	\$7,200 – \$51,000	\$21,600 – \$153,000	Click here for diamond from James Allen
4.0 carat	\$8,400 – \$71,500	\$33,600 – \$286,000	Click here for diamond from James Allen
5.0 carat	\$9,600 – \$67,500	\$48,000 – \$337,500	Click here for diamond from Blue Nile



Ruby (including pink)– price of cut stones

Origin	Quality & price per carat (in US\$; K=1000)					
	Size (ct)	Poor	Fair	Good	Very Good	Exceptional
Burma, Mogok (certified, untreated)	< 0.49	1–25	25–50	50–300	300–600	-
	0.5–0.99	1–60	60–350	350–700	700–3K	3K–4K
	1.0–1.99	1–400	400–800	800–3.5K	3.5K–4.6K	4.6K–10K
	2.0–4.99	1–900	900–1.5K	4K–5.3K	5.3K–11.5K	11.5K–125K
	5.0+	1–1.2K	1.5K–6.1K	6.1K–13.2K	13.2K–144K	144K–225K
All other sources*	< 0.49	1–25	25–50	50–300	300–500	-
	0.5–0.99	1–60	60–350	350–575	575–2.3K	2300–3.5K
	1.0–1.99	1–400	400–650	650–2.6K	2600–4K	4K–6K
	2.0–4.99	1–700	7.5K–3K	3K–4.6K	4.6K–7K	7K–20K
	5.0+	1–1K	1K–5.3K	5.3K–8K	8K–23K	23K–100K
Afghanistan, Jagdalek	1.0–1.99	1–400	400–650	650–2.6K	2600–4K	4K–6K
Burma, Mogok, Mong Hsu	2.0–4.99	1–700	7.5K–3K	3K–4.6K	4.6K–7K	7K–20K
Kenya	5.0+	1–1K	1K–5.3K	5.3K–8K	8K–23K	23K–100K
Sri Lanka						
Tanzania						
Thailand / Cambodia						
Vietnam (all generally heat treated)						

Blue sapphire – price of cut stones

Origin	Quality & price per carat (in US\$; K=1000)					
	Size (ct)	Poor	Fair	Good	Very Good	Exceptional
Kashmir, India Mogok, Burma (certified, untreated)	1.0–1.99	1–300	300–2K	2K–3.4K	3.4K–4.5K	4.5K–7.55K
	2.0–3.0	1–500	500–3.9K	3.9K–5.2K	5.2K–8.7K	8.7K–11K
	3.0–4.99	1–700	700–6K	6K–10K	10K–12.7K	12.7K–13.5K
	5.0+	1–1K	1K–11.5K	11.5K–14.6K	14.6K–15.5K	15.5K–45K
	All other sources	< 0.49	1–35	35–175	175–200	200–300
Australia	0.5–0.99	1–200	200–225	225–350	350–500	700–1.5K
China	1.0–1.99	1–250	250–450	400–575	575–700	1.7K–3K
Montana, USA	2.0–4.99	1–500	500–850	650–800	800–1.7K	3.5K–10K
Nigeria	5.0+	1–975	975–1.1K	1.1K–2K	2K–3.5K	
Sri Lanka						
Tanzania						
Thailand / Cambodia						
Vietnam (all generally heat treated)						

„Drahokam má takú cenu, za akú sa ho podarilo predat“

-doc. Mgr. Jan Cempírek, Ph.D.

Zdroje

- <https://lotusgemology.com/index.php/library/articles/346-pressure-heated-sapphire-squeezing-sapphire-corundums-treated-with-high-temperatures-and-low-pressure-ht-p>
- <https://www.emerald-gemstone.com/emerald-treatments/>
- Prezentácie od doc. Mgr. Jan Cempírek, Ph.D. , G6661: Gems and their deposits, jar 2023