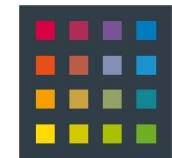


Tourmaline colors from Morogoro, Tanzania



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Menahem Sevdermish, FGA D. Litt.
Guy Borenstein, FGA EGG
European Gemological Center, Ramat Gan

Morogoro, Tanzania

- The source of many gems including Spinel, Ruby, Sapphire and Tourmaline.



The rough

- Superb quality, crystal clear, chrome tourmaline with little or no pleochroism.



The rough

- In earth tone rough, unique pleochroism covering most of the spectrum save blue, violet and purple.

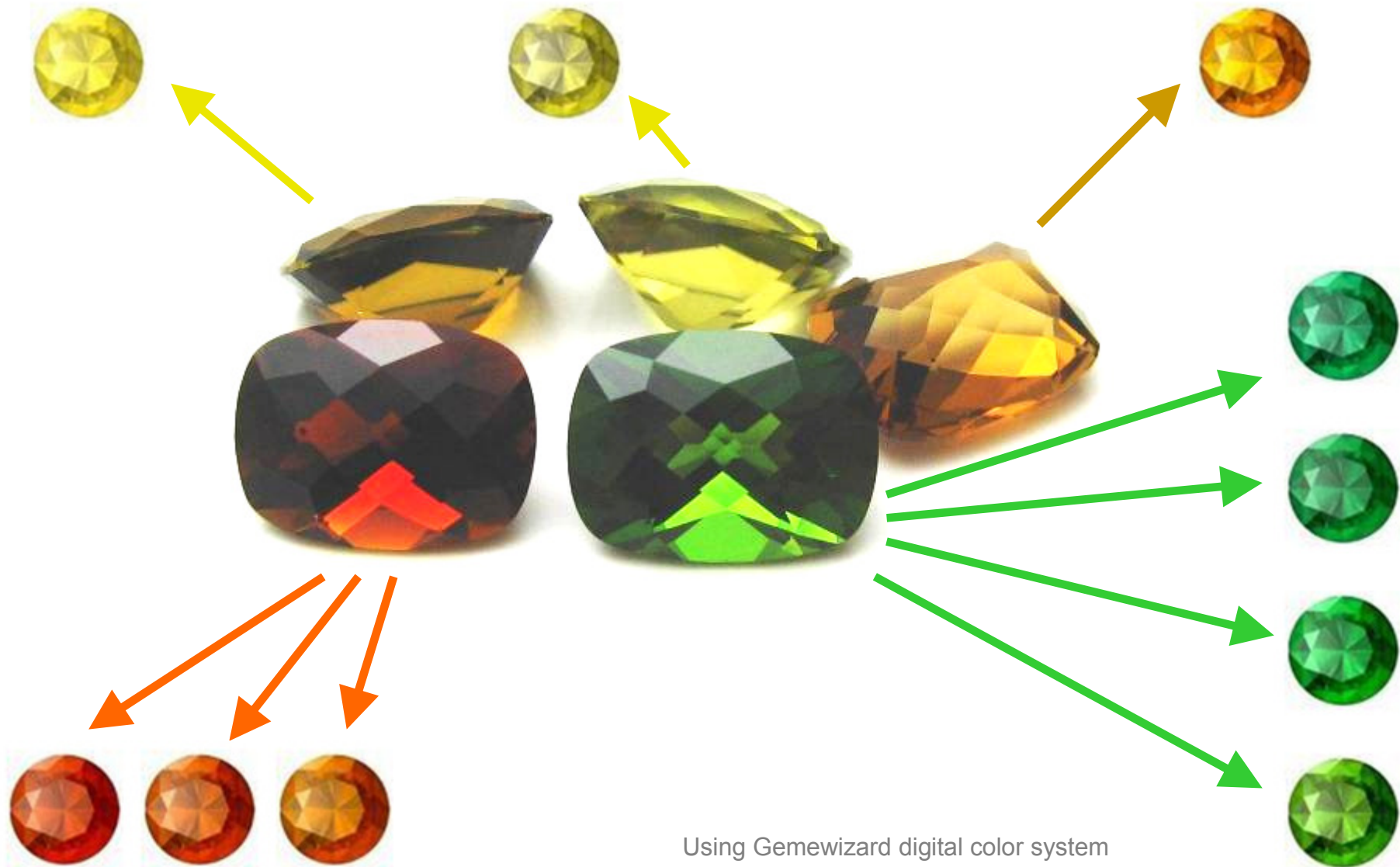


Gemological properties

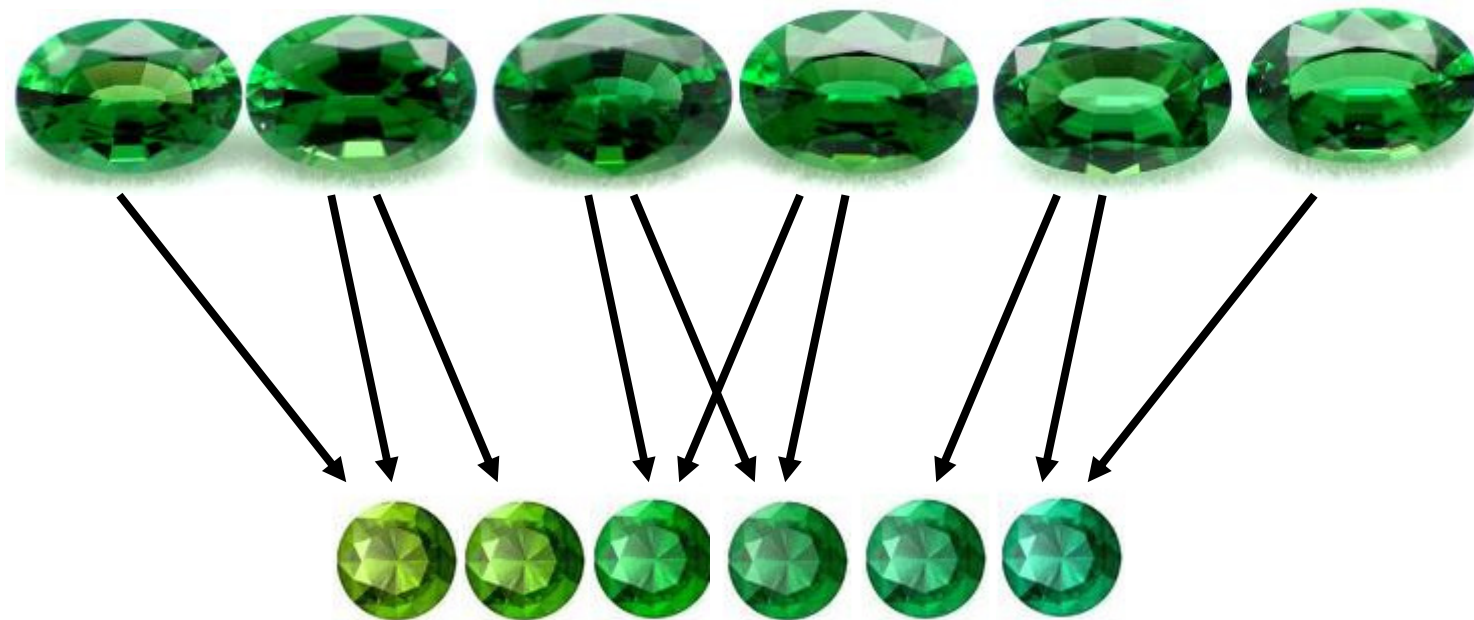
Gemological properties as obtained by the GIA and University of Oklahoma:

- **Identification:** uvite-dravite tourmaline
- **EDX analysis:** Ti concentration (~0.5-1.1 wt.%)
- **RI:** $n_o=1.641-1.643$
 $n_e=1.622-1.623$
- **BIR:** 0.019-0.021
- **SG:** 3.05-3.07
- **Fluorescence:** LWUV: inert
SWUV: weak to strong chalky greenish yellow
- **Chelsea filter:** none to moderate red (95%)

The amazing colors of Tanzanian tourmaline

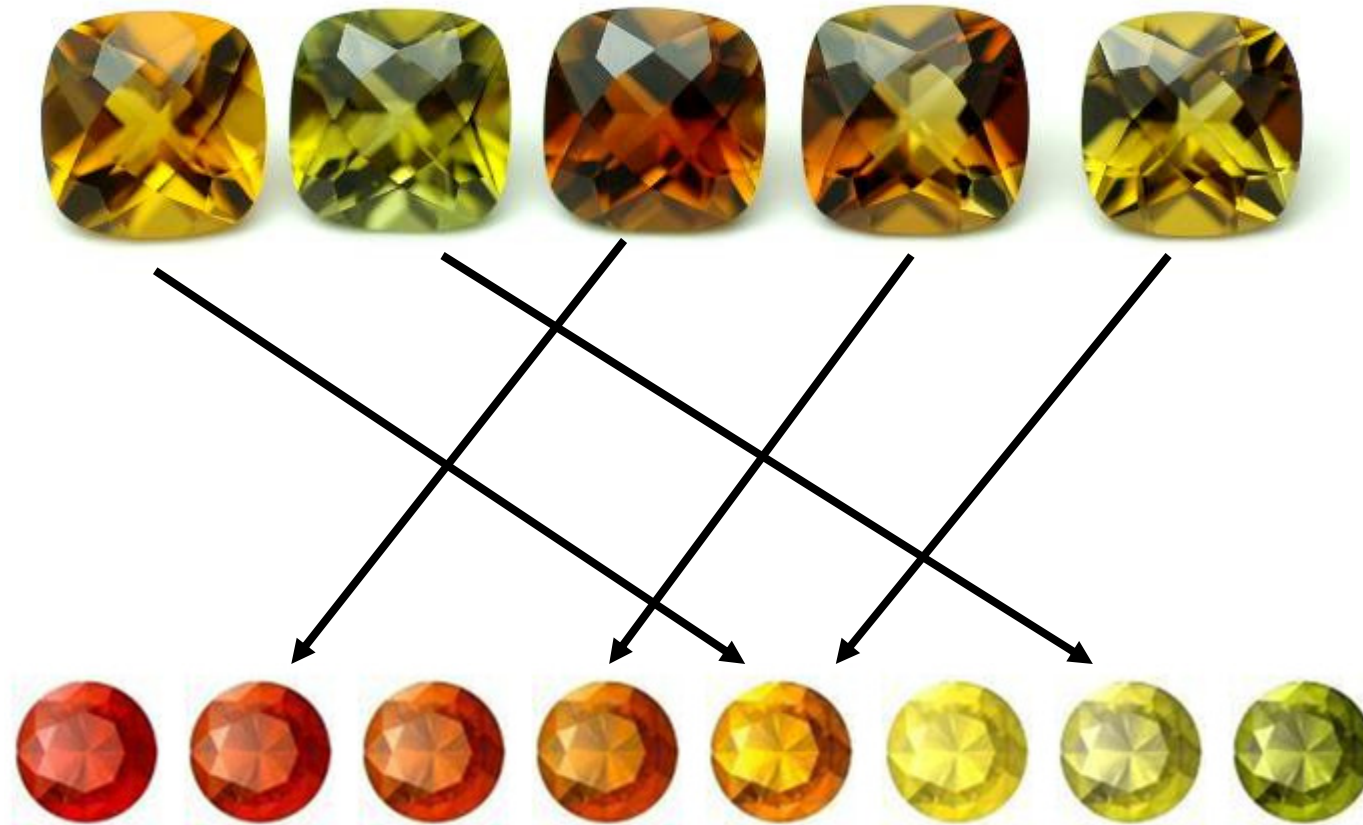


Chrome tourmaline colors



Using Gemewizard digital color system

Earth tones / 'Autumn' tourmaline colors



Using Gemewizard digital color system

Dichroism in tourmaline

- **Chrome tourmaline:**

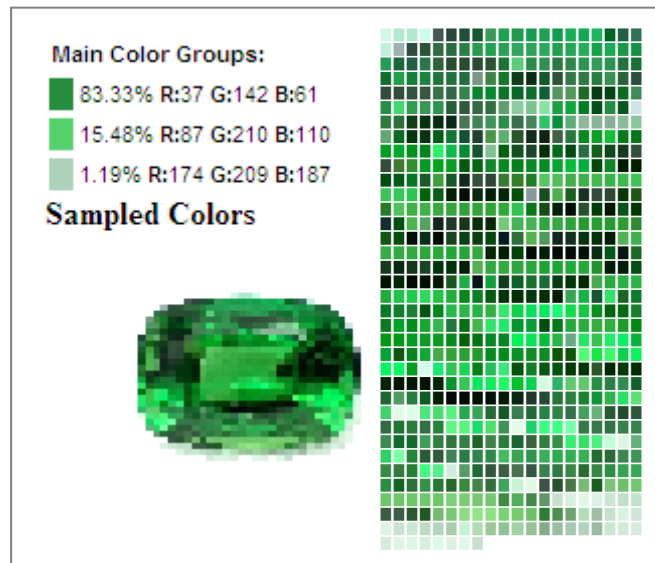
Colors ranging from bluish green to green to yellowish green.
Commonly, two colors of the same hue.

- **Earth tones tourmaline:**

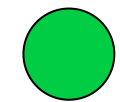
Two colors ranging from green to yellow to orange to red.



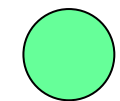
Chrome (pure green) tourmaline



Dichroism



83.33%

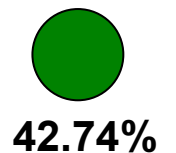
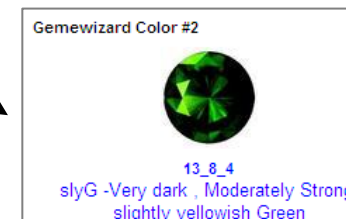
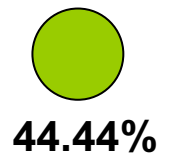
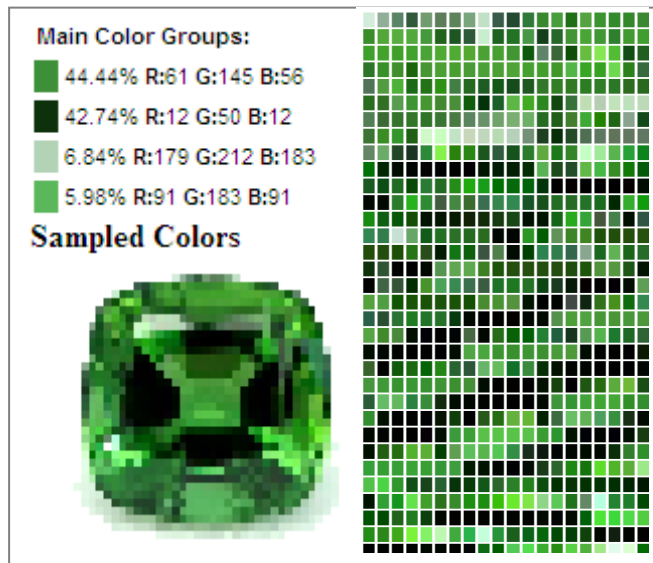


15.48%

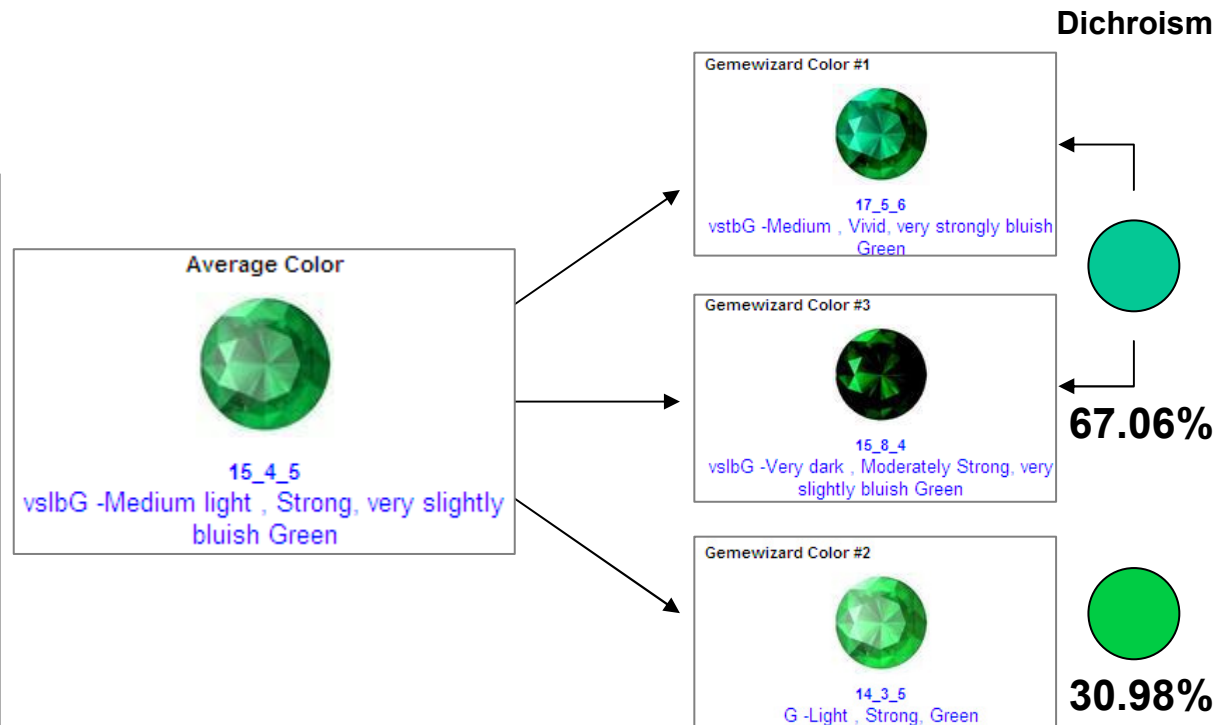
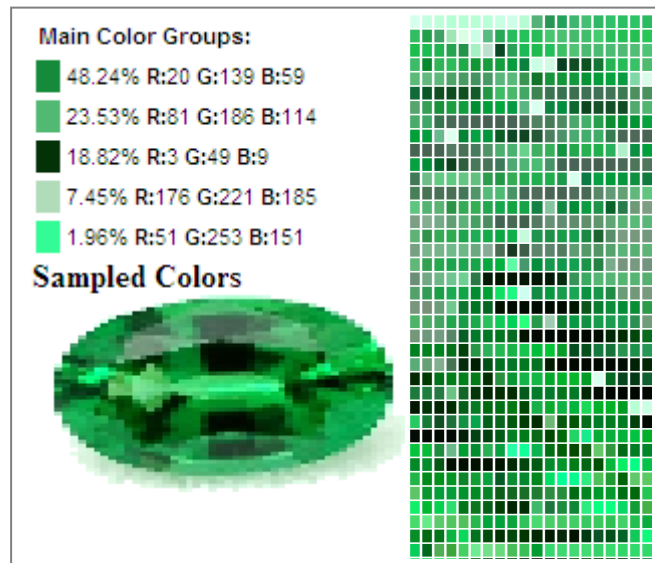
Chrome (slightly yellowish green) tourmaline



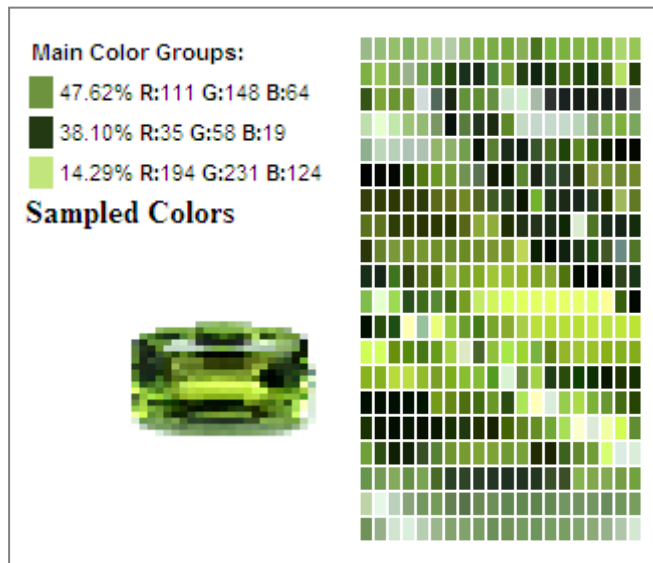
Dichroism



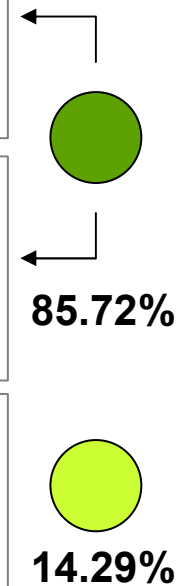
Chrome (slightly bluish green) tourmaline



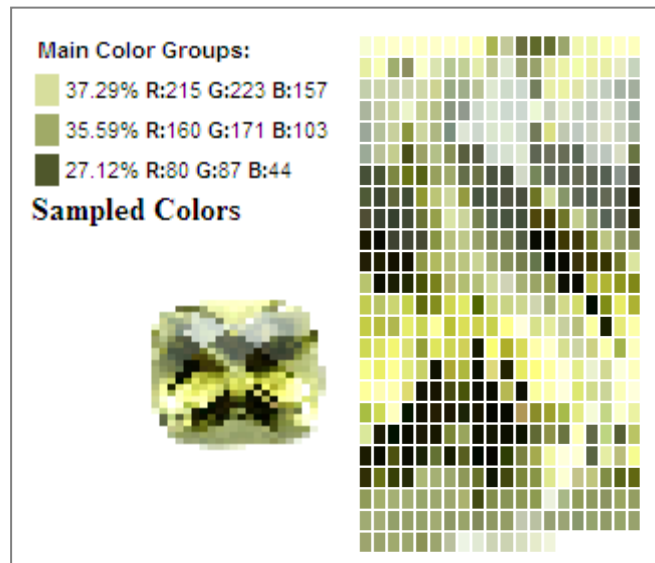
yellowish Green tourmaline



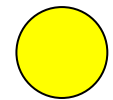
Dichroism



grayish Yellow tourmaline



Dichroism

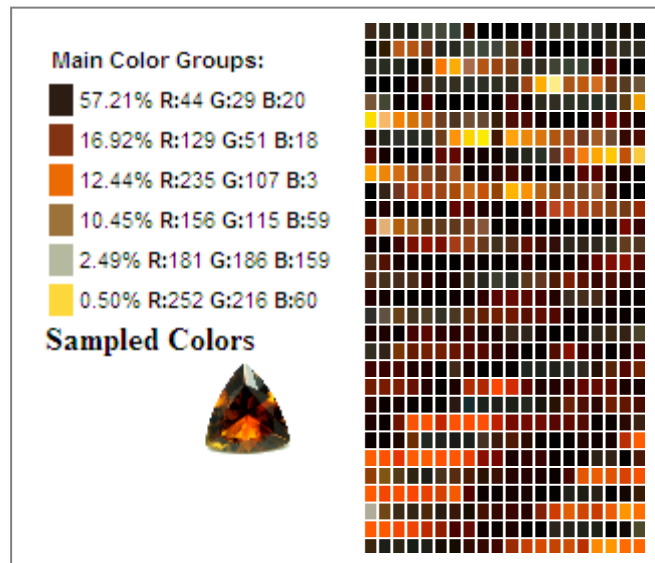


37.29%

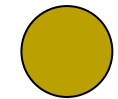


62.71%

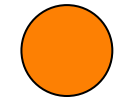
brown Red tourmaline



Dichroism



57.21%



29.36%

Summary

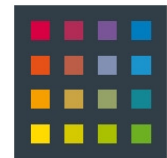
- Tanzanian Morogoro tourmaline cover most of the spectrum save blue, violet and purple.
- They display unique pleochroic colors.
- Our research enabled us to digitally measure and record, for the first time, the extent of pleochroism in gems.
- Paving the way, to record color phenomenon in gems.

Acknowledgements

- **Gemewizard team, headed by Guy Borenstein FGA EGG** – for color analysis and research.
- **Advanced Quality ACC, Ramat Gan & Bangkok** – for the images of rough and cut.
- **Joe Orlando, Quality Gold** – for the invaluable comments and advice.
- **Carol** – for pointing me to these amazing earth tones color combinations way back in the mines.

Thank you!

Questions?



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