

ANDALUSITE; WARM CONTRASTING GREENS AND REDS IN ONE GEM

Çiğdem Lüle, PhD, FGA, GIA GG, DGA

Gemstones are arguably the most aesthetic representatives of minerals in nature. Common understanding of a gem's beauty is attributed to its color and transparency. However, there are other mineralogical properties that might make a gemstone attractive, even unusual. One such property, technically known as pleochroism, is a helpful feature for identification and when it is strong enough to be visible to the naked eye, it sets the gemstone apart from the others.

Pleochroism is simply the gemstone's ability of displaying different colors in different directions. In essence, a gem must be doubly refractive and colored in order to display pleochroism. Technically, double refraction in a crystal causes different vibration of light in different directions, therefore different colors. In most cases, the difference is so subtle that gemologists need to detect and observe pleochroism with a dichroscope. In certain gems, however, such as iolite or andalusite, pleochroism may be observed without an instrument. Andalusite is a textbook example of eye visible pleochroism because its pleochroic colors are typically contrasting greens and reds. Sadly, these reds and greens are not the well saturated versions. They are often modified by brown.

Andalusite is an aluminum silicate mineral with an identical chemical formula to sillimanite and kyanite. These three minerals are known as polymorphs, the



*Andalusite displaying red and green pleochroic colors.
Courtesy of www.joopygems.com*



*Faceted and rough andalusite from Brazil.
Courtesy of Bonham's Auctions.*

same situation as graphite and diamond. Despite their identical chemistry, their crystal structures, therefore colors, are entirely different. All three are known and used as gemstones, but andalusite is distinctively more attractive than the others thanks to its strong pleochroism. The distinctive colors are contrasted well by the gem cutter when the stone is oriented correctly. Fine grade andalusite is typically faceted and have elongated shapes that allow tips displaying one color where the other color is centered. High clarity stones are known, while commercial grade andalusites are often cut as beads and cabochons. Commonly traded sizes are smaller than 3 carats, but larger sizes are available. Larger than 5 carat gems are considered rare and over 20 carats are extremely rare. As the name suggests, its type locality is the Andalusia region of Spain, however, almost no mining of andalusite exists there today. The highest production comes from Brazil and occasional gems are found in Sri Lanka, Madagascar, and Burma.

Identification of andalusite is fairly straightforward due its unusual set of properties. No synthetic pro-



*Brazilian andalusite, 15.37ct.
Courtesy of Bonham's Auction.*

duction is reported in gem trade. Some green crystals are rarely heat treated to bring out more red components. The treatment is stable and undetectable. Two other varieties of andalusite are known as chiasolite, an opaque variety with dark inclusions shaping like a cross, and viridine, the rare green transparent variety without red/pink pleochroism. ♦

Gemworld International, Inc., 2640 Patriot Blvd, Suite 240, Glenview, IL 60026-8075, www.gemguide.com
© 2022Gemworld International, Inc. All rights reserved.

All articles and photographs that appear are copyrighted by the author; the contributing person or company, or Gemworld International, Inc. and may not be reproduced in any printed or electronic format, posted on the internet, or distributed in any way without written permission. Address requests to the editor-in-chief.

The opinions expressed in this publication are the opinions of the individual authors only and should not necessarily be considered to be the opinions of the staff of Gemworld International, Inc. as a whole. Any website listings that appear in articles are for informational purposes only and should not be considered an endorsement of that company.