

New Opal Nomenclature

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New Opal Nomenclature

The use of standardised descriptions for opal is considered key in establishing consumer confidence in the product. For example, when a customer buys a black opal at some expense they need to be confident that is indeed what is widely recognised as a "black" and not a lesser stone.

Over the past few years the Gemmological Association of Australia (GAA) has worked at developing a defining nomenclature (that is descriptive naming system) for opal through a specialised subcommittee chaired by Anthony Smallwood FGAA, GG. After broad industry wide consultations, the following opal nomenclature system has been developed and is reproduced here with the kind permission of the GAA.

The Opal Association strongly endorses the use of these definitions with the aim of standardising nomenclature across the opal industry worldwide.

NOTE: Due to a wide variation of colour values portrayed by web browsers and PC monitors, the sample colourings shown in this article can be taken as representative only. For a true representation of the colour definition and tone values of the illustrations reproduced in this paper, please purchase a copy of the original article published in The Australian Gemmologist Volume 19, Number 12, October-December 1997, or purchase the GAA's Opal Nomenclature Poster

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INTRODUCTION

For many years the terminology and nomenclature used to describe opal has been widely discussed and debated by gemmologists and those members of the gem and jewellery industry who have an interest in this gemstone. Aspects of this long-running discussion can be seen in the long list of papers published throughout the forty year history of The Australian Gemmologist. But, how to best describe opal (arguably the most beautiful of gemstones) has been a contentious and difficult issue for a very long time — and may well remain so for some time to come. However, as a consequence of factors such as: growing international and local awareness of opal as a major Australian resource; the emergence world-wide of a real desire to standardise all terminology related to gemstones; and the ever growing number of synthetics and imitations that are appearing in world markets; it has become necessary to agree on some well based concepts of how a unique gem material, such as opal, should be described. It was late in 1993 that the Australian Gemstone Industry Council requested the then President of The Gemmological Association of Australia (GAA), Grahame Brown, to initiate investigations into the possibility of establishing a uniformly accepted nomenclature for opal. After a short time, a working sub-committee of the GAA was formed that consisted of representatives of The Gemmological Association of Australia, the Australian Gem Industry Association (AGIA), and the Lightning Ridge Miners Association (LRMA). Now, after three years of discussion, correspondence, and a plethora of drafted documents, and what seemed to be a never ending train of ideas and criticisms, a final draft nomenclature has been agreed-to, ratified, published, and is presented in this paper. The Australian Gemstone Industry Council (AGIC) has accepted this nomenclature in its final draft, as has the GAA's 1996 and 1997 Federal Conferences in Tasmania and Perth — albeit with one or two small amendments to the final draft. Now the AGIC hopes to actively progress production of a full colour publication and video on this opal nomenclature for distribution on a world-wide basis over the next twelve months. As Chairman of the GAA's Opal Nomenclature sub-committee I would like to express my gratitude to Jack Townsend (South Australia), Kathy Endor (Queensland) and Andrew Cody (Victoria) for their untiring efforts and fruitful discussions. Also, this author wishes to express his appreciation for the work and constant liaison of the AGIA sub-committee members Glenn McKean, Drago Panich, Peter Sherman, and Peter Evans, as well as the generous support and hospitality offered by members of the LRMA — in particular Joe Schellnegger, Maxine O'Brien, and Frank Palmer. I would encourage all members of the GAA to read and to use this nomenclature — in their every day activities, such as buying and selling, and in scientific correspondence and lectures. This nomenclature remains, according to GAA Past President Ronnie Bauer and the AGIA's Andrew Cody, a 'living document'. As time passes there will be, no doubt, more discussion and criticism of this nomenclature. This will be most welcome, as are any questions — all of which may be forwarded in writing to the GAA's Opal Nomenclature Sub-committee either care of the Federal Office of the GAA at P.O. Box A791, Sydney South NSW 1235, or direct to the author at P.O. Box 692, Sutherland NSW 2232. The nomenclature and classification of opal, that follows, is reproduced, verbatim, from the Resolutions of the Federal Council of the Gemmological Association of Australia (dated 17th May, 1997).

OPAL NOMENCLATURE AND CLASSIFICATION

INTRODUCTION

Opal is Australia's National Gemstone. Australia produces 95 per cent of the world's supply of precious opal. This nomenclature encompasses all types and varieties of opal. It provides a standardisation of terminology, but does not establish any methodology of valuation. The Australian Gemstone Industry Council Inc., in collaboration with the Australian Gem Industry Association Ltd, The Gemmological Association of Australia Ltd, the Lightning Ridge Miners Association Ltd, and the Jewellers Association of Australia Ltd, has produced the following nomenclature for the classification of opal.

OPAL CLASSIFICATION

Opal is a gemstone consisting of hydrated amorphous silica with the chemical formula $\text{SiO}_2 \cdot n\text{H}_2\text{O}$. There are two basic forms of opal described by visual appearance. Precious Opal — is opal which exhibits the phenomenon known as play-of-colour (Figs. 1A-D), which is produced by the diffraction of white light through a micro-structure of orderly arrayed spheres of silica. Common Opal and Potch — is opal which does not exhibit a play-of-colour (Fig. 2). The distinction between common opal and potch is based on their formation and structure. Potch is structurally similar to precious opal but has a disorderly arrangement of its silica spheres. Common opal shows some degree of micro-crystallinity.



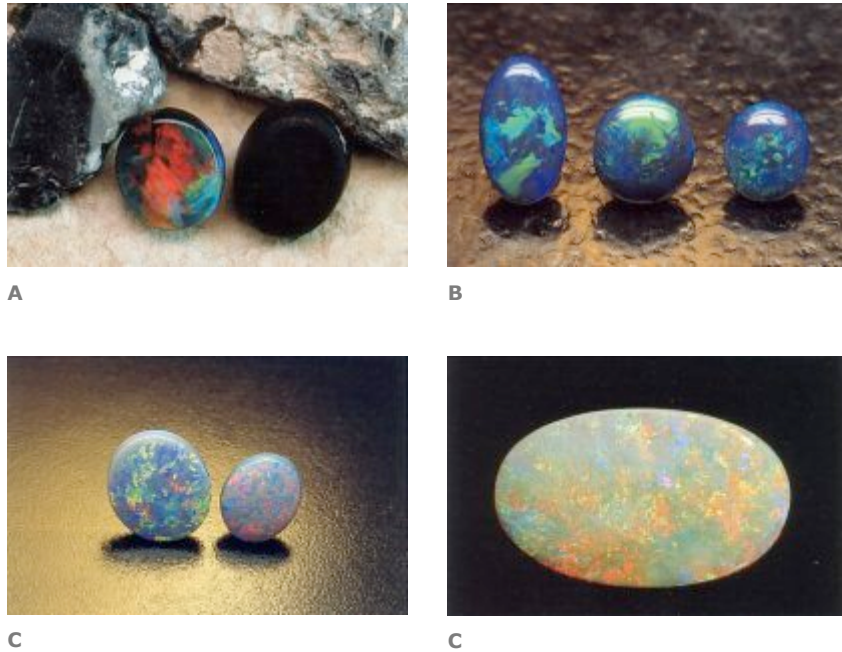


Fig. 1. Black, dark and light precious opals displaying a strong play-of-colour. (A) Black opal of N2 body tone and a dominant red-orange play-of-colour. (B) Black opal of N3 body tone and a dominant blue-green play-of-colour. (C) Dark opal of N5 body tone and a green play-of-colour. (D) White opal of N1 body tone and a red-blue play-of-colour. (Photographs, R. Weber).



Fig. 2. A faceted common 'sun' opal from Australia. (Photograph, G. Brown).

TYPES OF NATURAL OPAL

Natural opal is opal which has not been treated or enhanced in any way other than by cutting and polishing. There are three types of natural opal, with varieties described by the two characteristics of body tone and transparency.

Natural Opal Type 1 – is opal presented in one piece in its natural state apart from cutting or polishing, and is of substantially homogenous chemical composition. (See figure 3A).

Natural Opal Type 2 – is opal presented in one piece where the opal is naturally attached to the host rock in which it was formed and the host rock is of a different chemical composition. This opal is commonly known as boulder opal. (See figure 3B).

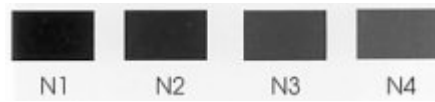
Natural Opal Type 3 – is opal presented in one piece where the opal is intimately diffused as infillings of pores or holes or between grains of the host rock in which it was formed. This opal is commonly known as matrix opal. (See figure 3C).



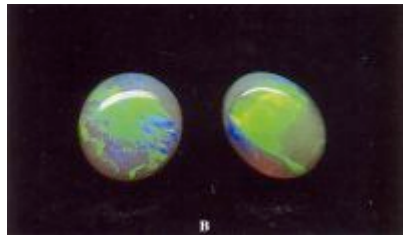
Fig. 4. Approved scale of body tone for precious opal There are three varieties of opal based on body tone.

The body tone of an opal is different to the play-of-colour displayed by precious opal. Body tone refers to the relative darkness or lightness of the opal, while ignoring its play-of-colour. This is assessed on a Scale of Body Tone (Fig 4.).

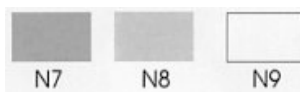
The boxes (below) comprising this scale, represent approximate values of body tone in equal intervals from black to white. This arrangement is in agreement with all known scales of tone used in colour science, and is well illustrated in the commercially available Rock-color Chart † produced by the Geological Society of America. An AGIA scale of Body Tone is being developed, using computer-generated graphics, and when available, will correlate with the GSA Rock-color Chart.



Black Opal – is the family of opal which shows a play-of-colour within or on a black body tone when viewed face-up.(See figure 5A), and may be designated N1, N2, N3 or N4 on the Scale of Body Tone.



Dark Opal – is the family of opal which shows a play-of-colour within or on a dark body tone, when viewed face-up (See figure 5B), and may be designated N5 or N6 using the Scale of Body Tone.



Light Opal – is the family of opal which shows a play-of-colour within or on a light body tone, when viewed face-up (See figure 5C), and may be designated N7, N8, or N9 on the Scale of Body Tone. The N9 category is referred to as white opal (See figure 1).

Fig. 5. Varieties of opal based on body tone. (Photographs, R. Weber)

Opal with a distinctly coloured body (such as yellow, orange, red or brown) should be classified as black, dark or light opal, by reference to the Scale of Body Tone, and also have a notation stating its distinctive hue appended to its determined body tone. (See figures 6, 7, 8, 9 & 10).

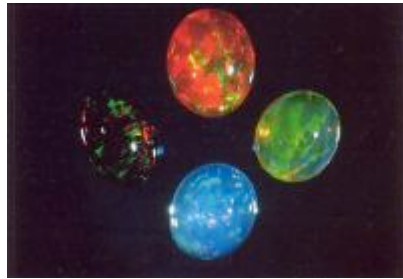


Fig. 6. Mexican opal of black to light body tone and of various hues. (Top) Dark orange crystal opal (Right) Light yellow crystal opal (Bottom) Dark blue crystal opal (Left) Black opal. (Photograph, Weiss Opals, Germany)

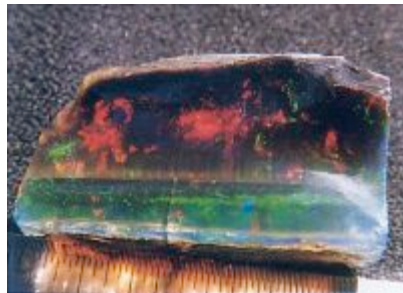


Fig. 7. Black crystal opal from Virgin Valley (USA). (Photograph, P. Brown)



Fig. 8. Indonesian opals of dark to light body tone. (Top left) Light opal (Centre) Dark orange opal (Bottom right) Dark opal. (Photograph, G. Brown)



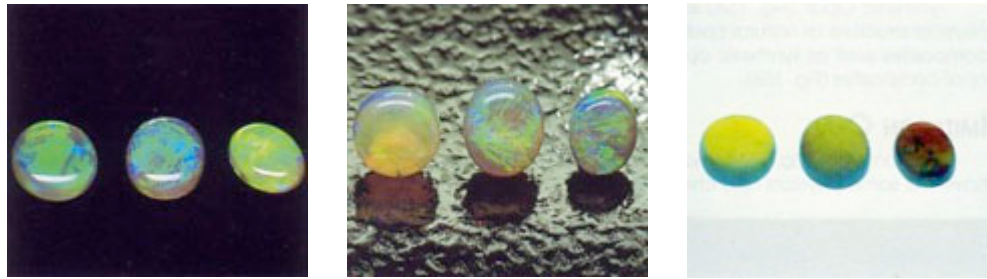
Fig. 9. 'Hungarian' opal rough of 594g (13x7x7cm) from the Naturalhistorisches Museum, Wien. This type 1 opal displays body tones ranging from white opal (N9) to dark blue opal (N5).



Fig. 10. Light opal of N7 body tone from Brazil. (Photograph, G. Brown)

Transparency

Opal shows all forms of diaphaneity that range from transparent to opaque. Natural precious opal which is transparent to semi-transparent is known as crystal opal (Figs. 11A-C). Crystal opal can have either a black, dark or light body tone. In this context, the term 'crystal' refers to the appearance of the opal and not its crystalline structure.



A

B

C

Fig. 11. Crystal opal displaying its identifying diaphaneity. (A) Crystal opals shown face-up against a black background which enhanced the brilliance of these opals' play-of-colour. (B) The same crystal opals shown face-up against a reflective background that subdues the opal's play-of-colour. (C) The same crystal opals viewed in transmitted light. Note the play-of-colour of these opals is hidden, and their true transparency is revealed. (Photographs, R. Weber)

OPAL

TREATMENTS

Opal can be subjected to various types of treatment. Present CIBJO guidelines state that any method of treatment other than standard cutting and polishing must be disclosed and the process used specified on all invoices, advertising, and commercial documents. Types of treatments include colour and/or tone enhancement (Fig. 12), heating, painting, dyeing, resins and waxes, oiling or any application of chemicals. Opal also may be treated to change its natural appearance or durability. (See the discussion on composite opals, below). The body tone of opal is often enhanced (usually appearing darker) in some opal inlay jewellery where a thin piece of solid crystal opal has black paint or black glue applied, or the opal is set above black painted jewellery.

COMPOSITE

NATURAL

OPAL

Composite natural opal consists of natural opal laminates, manually cemented or attached to another material. The opal component is natural opal. There are three main forms of composite opal: Doublet Opals - are a composition of two pieces where a slice of natural opal is cemented to a base material (Fig. 13).

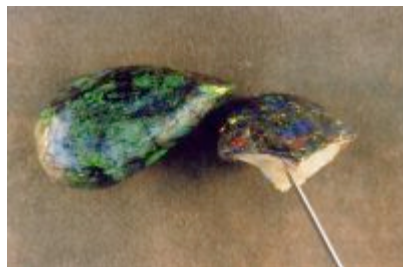


Fig. 12. Treated (carbonised) dark Andamooka matrix opals. (Photograph, R. Weber)



Fig. 13. A ring-mounted black Lightning Ridge-type composite doublet opal. (Photograph, G. Brown)

TRIPLET OPALS - are a composition of three pieces where a thin slice of natural opal cemented between a dark base material and a transparent top layer (usually of quartz or glass). Mosaic and Chip Opals - are a composition of small flat or irregularly shaped pieces of natural opal cemented as a mosaic tile on a dark base material (Fig. 14) or encompassed in a resin.

SYNTHETIC

OPAL

'Synthetic Opal' (Fig. 15A) is material which has essentially the same chemical composition and physical structure as natural opal but has been made by laboratory or industrial process. Synthetic opal composites exist as synthetic opal doublets, triplets or

mosaics. These must be disclosed as synthetic opal composites (Fig. 15B).

IMITATION

Imitation Opal (Fig. 16) is material which imitates the play of colour of natural opal, but does not have the same physical and chemical structure or gemmological constants as natural opal.

OPAL



Fig. 14. A mosaic dark opal composite. (Photograph, R. Weber)



Fig. 16. A 'thin-film' imitation dark opal by Pauley. (Photograph, R. Weber)



Fig. 15A. A Gilson™ synthetic black opal. (Photograph, G. Brown)

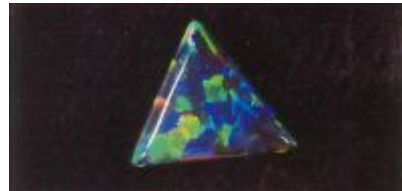


Fig. 15B. A black Gilson™ synthetic opal composite doublet. (Photograph, G. Brown)

CLASSIFICATION REPORTS