during the high-temperature heating process.

Shane McClure, of the GIA Gem Trade Laboratory in Carlsbad, told the audience that it is "unacceptable" for treaters to try to legitimize a new treatment process by attempting to pass it unnoticed through laboratories. "Even if they do get through at first, we will find out eventually."

Terry Coldham, of Sapphex, Sydney, Australia, said that the treaters were experts in particular types of corundum, and could process rough in such a way as to make detection of the treatment very difficult.

At a press conference held the next day, Douglas Hucker, of AGTA, Dallas, Texas, reported that the Jewelers of America, Jewelers Vigilance Committee, American Gem Society, and AGTA were issuing a five-point communiqué regarding this treatment. This communiqué (1) confirmed that the corundum is being subjected to a bulk/lattice diffusion treatment that creates new colors or alters existing colors; (2) maintained that this treatment must be disclosed at all levels of the trade, per Federal Trade Commission Guidelines and industry practices; (3) warned that recutting some of the treated stones could affect their color; (4) recommended that buyers consider establishing written vendor agreements stipulating terms of disclosure; and (5) affirmed that U.S. laboratories would continue efforts to identify the treatment, support the trade, and protect the consumer.

The following week, the Chanthaburi Gem & Jewelry Association (CGA), comprised of some of the biggest players in heat treatment, agreed to disclose the use of beryllium to enhance the color of some types of corundum. The action was welcomed by the gem trade worldwide. The 60 association members present unanimously agreed that:

- Chrysoberyl is being intentionally added to the crucible during the new heat treatment as a source of beryllium to enhance color in corundum.
- All association members are obligated to disclose and differentiate the new treatment to customers. The CGA agreed to add the code letter "A" to invoices of such treated material.

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GNI Regular Features

DIAMONDS

European Commission approves the De Beers Supplier of Choice initiative. The European Commission (EC) granted formal approval of the De Beers Diamond Trading Company's (DTC) Supplier of Choice initiative on January 16, 2003. This confers a legal stamp of approval on De Beers's marketing and distribution system for rough diamonds.

However, the EC registered an objection to the DTC's five-year agreement with Alrosa, Russia's principal diamond mining and marketing operation, to sell $800 million worth of rough diamonds on the Russians' behalf.

The DTC has begun preparing for the formal implementation of the Supplier of Choice initiative in July 2003. It is surveying current and potential clients to determine their distribution and marketing programs, especially with the view of having them commit more funds and resources toward helping downstream retailers and jewelry manufacturers increase diamond sales. Clients are also required to sign a series of "Best Practice Principles," which ban trading in conflict diamonds altogether and trading in treated diamonds without proper disclosure.

Once the questionnaires are completed, the DTC will assess each client's position in the market, effectiveness in serving that market, and ability to increase diamond sales. The company will use that information to determine future diamond allocations for existing clients, to possibly drop some clients from its active list, and to appoint new clients now on the potentials list. The DTC must give six months' notice to clients it drops from its active list. In turn, the DTC agrees to tailor diamond allocations more closely to clients' actual needs.

Disputes between clients and the DTC will be handled by an ombudsman, appointed by the DTC and approved by the EC. If no agreement is reached within 25 days, the matter will be determined by arbitration in London.

The EC objected to the DTC agreement with Russia because the DTC's 50% share of Russian production would enable the company "to maintain its dominant share of the diamond market." Russia and De Beers have begun talks to alter their marketing agreement to address EC objections. In this regard, *Idex Magazine* and Russian press sources say that the DTC would scale down its Russian purchases by 25%.

Russell Shor

A type IaB diamond showing a "tatami" strain pattern. The SSEF Swiss Gemmological Institute recently examined an unusual type IaB diamond. During the initial grading process, observation of this colorless 3.54 ct stone with the SSEF Diamond Spotter revealed that it was transparent to short-wave UV radiation. UV transparency is characteristic of both type II and type IaB diamonds. While type II diamonds do not contain enough nitrogen to be detectable with an infrared spectrometer, type IaB diamonds contain a variable concentration of nitrogen atoms (clustered in so-called B aggregates), with a major infrared absorption centered at 1175 cm^{-1}. FTIR spectroscopy of this diamond confirmed that it was type IaB with a low nitrogen concentration—less than 10 ppm. This nitrogen estimate was determined from the absorption coefficient value at 1282

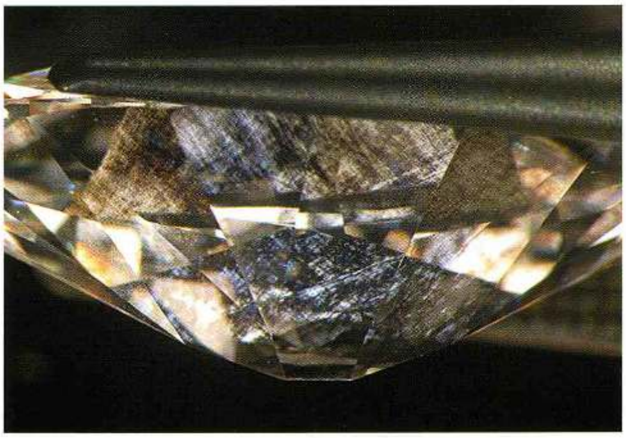

Figure 22. In cross-polarized light, a tatami strain pattern was observed in this 3.54 ct type IaB diamond with a low nitrogen concentration. Photomicrograph by J.-P. Chalain, © SSEF.

cm^{-1} (see S. R. Boyd et al., "Infrared absorption by the B nitrogen aggregate in diamond," *Philosophical Magazine B*, Vol. 72, No. 3, 1995, pp. 351–361).

Microscopic observation of the diamond between crossed polarizing filters showed a crosshatched or "tatami" strain pattern (figure 22). This pattern was described by R. E. Kane more than two decades ago ("The elusive nature of graining in gem quality diamonds," Summer 1980 *Gems & Gemology*, pp. 294–314). More recently, T. M. Moses et al. documented this particular strain pattern in a large population of HPHT-treated diamonds ("Observation of GE-processed diamonds: A photographic record," Fall 1999 *Gems & Gemology*, pp. 14–22). In a subsequent article, C. P. Smith et al. underlined that the tatami pattern is not necessarily indicative of HPHT treatment ("GE POL diamonds: Before and after," Fall 2000 *Gems & Gemology*, pp. 192–215).

Like colorless type II diamonds, colorless type IaB diamonds may be HPHT treated (see B. Deljanin and E. Fritsch, "Another diamond type is susceptible to HPHT: Rare type IaB diamonds are targeted," *Professional Jeweler*, October 2001, pp. 26–29). Therefore, before grading the diamond, low-temperature analysis (at approximately −120°C) was performed to establish the origin of its color. UV-Vis spectroscopy showed features typical of type IaB diamonds: total absorption at 225 nm and a triplet absorption feature with two major peaks at 230 and 236 nm. Photoluminescence spectrometry, together with the data collected in the infrared and UV-Vis regions, proved the diamond to be naturally colorless.

The continuous, three-dimensional propagation of strain through a diamond crystal is hampered by the presence of nitrogen (see Chapter 3 of R. Berman, Ed., *Physical Properties of Diamond*, Clarendon Press, Oxford, 1965). Thus, most type II diamonds, with almost no nitrogen, show "tatami" strain, which extends throughout the sample with approximately the same magnitude in all directions. In contrast, type Ia diamonds usually show banded strain, with one direction strongly dominating the strain distribution. The 3.54 ct diamond reported here had enough nitrogen to show that it is grouped in B aggregates (as evidenced by the FTIR spectrum), but not enough to disturb the strain distribution significantly, if at all (as shown by the tatami pattern). Moreover, in the past SSEF examined a type IaAB diamond that showed both a weak tatami strain pattern and a slight short-wave UV transparency (as seen with the SSEF Diamond Spotter). From the FTIR spectrum, the total nitrogen content was estimated at 14 ppm. Therefore, that type IaAB diamond also contained very little nitrogen and likewise showed a tatami strain pattern.

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COLORED STONES AND ORGANIC MATERIALS

Poldervaartite from South Africa. Poldervaartite, a very rare Ca-Mn-silicate, was described as a new mineral from the Wessels mine in South Africa nearly a decade ago (Y. Dai et al., "Poldervaartite, $Ca(Ca_{0.5}Mn_{0.5})(SiO_3OH)(OH)$ . . .," *American Mineralogist*, Vol. 78, 1993, pp. 1082–1087). Few examples were known until recently, when approximately 5,000 specimens were recovered during the mining of manganese ore at the nearby N'Chwaning II mine, from October 2001 to February 2002 (B. Cairncross and J. Gutzmer, "Spektakulärer Neufund. . . ," *Lapis*, Vol. 27, No. 5, 2002, pp. 30–34). No additional specimens have been found since then. In the vast majority of specimens, the poldervaartite occurs as druses of "creamy" white opaque crystals. The best poldervaartite specimens form ball-like aggregates of "amber" yellow, pink, or nearly red crystals on a dark brown matrix; the translucent-to-semitransparent material can yield interesting, if rare, cut gems (figure 23).

Six faceted stones (0.57–6.06 ct, all cut from one spherical aggregate) were examined for this study. They showed a distinct color change—brownish yellow in day light, pinkish orange in fluorescent light, and orange in incandescent light—with very weak pleochroism. The smaller stones (under 1 ct) were semitransparent, whereas the larger stones were translucent (again, see figure 23). They were biaxial, with measured refractive indices of 1.670–1.690. However, considerably lower R.I.'s—n_x=1.634, n_y=1.640, and n_z=1.656—were given by Dai et al. (1993). Specific gravity, measured hydrostatically, was 3.03–3.12; this range is much higher than the original description (2.91). In a polariscope, these samples had the appearance typical of anisotropic aggregates, due to the fibrous structure of the spheres. All of the stones fluoresced deep red to short-wave UV radiation, but were inert to long-wave UV. No absorption lines were observed with a hand-held spectroscope.

Because the R.I. and S.G. values of this material were