PINK AND RED FANCY DIAMONDS: A REVIEW AND PERSPECTIVES

Karfunkel, J.[1]; Hoover, D.B.[2]; Renger, F.E.[1]; Walde, D.[3]; Moraes, R.A.V.[3]; Michelfelder, G.[4]; Ribeiro, L.C.B.[5]; Krambrock, K.[1]

[1]Universidade Federal de Minas Gerais, Belo Horizonte; [2]Springfield, Mo, USA; [3]Universidade de Brasília, Brasília DF; [4]Missouri State University, Springfield, Mo, USA; [5]Universidade Federal do Triângulo Mineiro, Uberaba

Among fancy diamonds, pink and red have been always very rare and highly priced and constitute the world's most expensive commercial gem known since antiquity. Ancient sources were Ethiopia, Borneo, Sumatra, Java, Urals, Goa, but the majority came from India. Brazilian deposits were discovered in 1714, with Diamantina, and some decades later Coromandel (Alto Paranaíba=AP) representing the more important producers and trade centers. Early Brazilian production was so large that consequently world prices dropped more than 50%. To avoid the market collapse, rumors were spread that Brazilian stones are of lower quality than the Indians. The Portuguese turned the tables by shipping goods from Goa through Brazil loading others (including diamonds) to Portugal, selling Brazilian diamonds including pink/red as of Indian origin. Diamonds have been "exported" by other ships to Amsterdam and London also. Thus, prior to the S-African monopoly, it is difficult to authenticate the country of origin of pink/red stones. However, in spite of the S-African monopoly, pink/red were and are very rare under the fancies from this continent. This scenery changed when the Argyle mine (Australia) became operational in 1985, the mine supplying an estimate of 90-95% of pink/red to the market. Life expectancy of the Argyle mine is predicted to about 2020. Therefore this tiny but extremely lucrative and important gem segment of fancies will not be able to meet in the near future the top fashion demand. The authors predict a different trend for the near future: most pink/red diamonds from Brazil come from the AP-region. In spite of tremendous efforts and high investments in traditional and high tech-prospecting methods over half a century, the primary source for diamonds in this region remains an enigma. Kimberlite Clan Rocks, alkaline-carbonatite complexes and volcaniclastics, all date to the Upper Cretaceous, and have similar geochemical and geophysical signatures. Nevertheless, the extrusive rocks of the Serra Negra/Salitre Complex (SNSC) with a 60 km deep plug, down to the mantle, is the only known source to supply such enormous quantity of erupted material scattered over a huge area. All diamonds in AP come from alluvial deposits. However the lower parts of the vulcaniclastics contain diamonds and are the main surface source for these alluvial deposits. There is no systematic diamond prospection in the vulcaniclastics, but the authors predict that the content could be locally economic. The relative abundance of pink/red from this region suggests that this relates to the large source in the super-volcano SNSC and the explosive nature of carbonatites which are unstable at pressures below 40 bars. Molten carbonatite will explode below the surface as it rises. The explosion shock pressure from this carbonatite causes the plastic deformation of the diamond lattice, forming the pink lamellar color bands, similar to shocked minerals at impact sites. Our prediction is that pink/red will be available to the future market mainly from the AP-region, and will supply most of these fancies to the high fashion segment.

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