AN INNOVATIVE APPROACH IN VALUE ADDITION TO SRI LANKAN GEMSTONES

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Sri Lanka is blessed with over 70 varieties of coloured gemstones out of 200 found in the world. The basic and most practiced value addition process of gemstones is faceting of gems. In Sri Lanka, export of rough gemstones is banned and only faceted gemstones are allowed for export. Faceting provides a approximately 25% value addition compared to rough gemstones prices. Production of phenomenal gems is a 30% value addition compared to rough material. Heat treatment of gemstones is practiced in Sri Lanka from many centuries. This was practiced in a very primitive way using a charcoal furnace and manual blowing and is still carried out by the veterans in the trade with promising results.

So far, heat treatment is carried out only for corundum varieties. At Prasent, it is possible to value add several gem varieties such as dark coloured tourmaline, zircon, dark coloured spinel and moonstones that are mined as raw material for the ceramic industry. So far, this material is sold for a petty sum and today value-added material is sought after by both local and overseas buyers for higher prices.

Gems are considered as girl's best friend and only sought after for jewellery. Yet most people do not know that 21 out of 32 crystallographic point groups are non-centrosymmetric point groups. As such some gemstones show some properties that could be harnessed for advanced scientific applications. If we harness these properties another golden era for the gem minerals is in the offing that would fill the country's coffers with dollars. Most gem varieties found in Sri Lanka have properties such as Piezoelectricity and Pyroelectricity and these properties could be used for advanced technical applications.

Piezoelectricity could be directly used to make censors that activate air bags found in modern vehicles. On the other hand, pyroelectricity could also be used for number of uses. Tourmaline possesses the best pyroelectric property that could be used to produce low cost water filters which traps heavy elements such as Arsenic, Cadmium, etc. This is an ideal water filter for areas badly afflicted with the chronic kidney disease of unknown aetiology (CKDu). The main advantage of this filtering material is that, once used for some time, the adsorbed heavy

element ions could be easily washed with ice-cold water or dilute acid. This water filter research is nearing completion. In addition, tourmaline emits Far-Infrared energy that kills fecal coliform bacteria found in most rural water bodies. The research is carried out by growing bacteria varieties such as Shigella, Salmonella, Escherichia coli in agar media having tourmaline filled wells. After the incubation period, bacteria growth was observed in the agar jelly tray around each tourmaline well. At present, some of our researchers have been able to produce fine tourmaline powder impregnated plasters for common wounds. These products were laboratory tested but since human clinical trials are banned in Sri Lanka, it is not possible to market the product.

The same research team has come up with tourmaline impregnated polymer that emits high Far-Infrared energy. This has been tested number of times with equal volume ice cube and ice melt on tourmaline impregnated polymer plate in a less time compared to normal polymer plate. Since this is heat energy, they have come up with a fat-burning waist band. In addition, these polymers were used to produce knee-guards, stockings and intimate apparel. These products too are laboratory tested and found to possess many therapeutic properties. The research is ongoing and ground-breaking results are expected soon.