

Investigation of the Use of Paddy Husk Silica as a Compound for Polishing Gem Minerals

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This research is focused on the use of paddy husk ash as a compound for the polishing purposes of gem materials. Most of the gemstones in the present day are polished by using diamond powder which often produces scratches and uneven surfaces on the facets on the surfaces on the facets owing to the greater hardness of the polishing medium which decreases the quality and value of the gemstones. Diamond is the hardest of all natural substances act as a cutting medium rather than a polishing medium. In this research, a spherical balls prepared by mixing paddy husk ash and cooked rice with an excess amount of water. This ball is eventually dried under the sun for four days. A special suspension medium was used to polish the gemstones with the paddy husk ash polishing agent. This polishing oil bonds the polishing powder to the polishing disk and retains the polishing powder intact during polishing. The polishing powder was embedded into a copper disk and was it used as the polishing plate. The silica based polishing paste were subjected to an XRF (X-ray Florescence) analysis to determine the elemental composition. XRF analysis shows that there were 92.1% of silica present as the major element. Remaining oxides are MgO, Al₂O₃, K₂O, SO₃, MnO and TiO₂ presents as minor elements in the sample. XRD (X-ray Diffraction) analysis shows that the bulk of the sample is amorphous. FTIR (Fourier Transform Infrared Spectroscopy) shows that the O-H, Si-OH, H-O-H and Si-O-Si bonds in the sample. Optically flat surfaces were produced when a gemstones were polished using this compound. This polishing compound has proved to be an excellent product to polish species and varieties of gems. It is an ideal substitute for diamond powder which very costly and less effective.

Keywords: Gem polish, XRF, XRD, FTIR