

MINERAL AND CHEMICAL CHARACTERIZATION OF IRON ORE DEPOSIT IN BUTTALA, SRI LANKA: IMPLICATION FOR ITS ECONOMIC POTENTIAL

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Iron ore deposits have greater industrial significance since they supply raw material for steel based industries and such applications are majorly based on their ore grade. Therefore, initial clear understanding of mineralogical and chemical characteristics of these ores would be advantageous. Present study aimed to characterize mineral and chemical composition of the iron ore deposit exposed in Buttala, Monaragala district, Sri Lanka and to assess its economic potential. Sampling was carried out systematically along the ridge of ore containing mountain and from the host rocks. Textural and weathering characteristics of the ore samples were determined in hand specimen scale. Detail mineralogy was analyzed on X-Ray Diffraction (XRD) analyzer while elemental characterization was performed on X-Ray Florescence (XRF) spectrometer. The deposit is mostly exposed as fresh ore bodies along the ridge of mountain covering about 550000 m² surface area and is hosted in garnet biotite gneiss. As indicated by the XRD results, common minerals of the ore deposit are magnetite and hematite with subordinate spinel and goethite. Average Fe₂O₃ content of the ore deposit is 78.84 wt. % with 55.14 wt. % of Fe content. This resulted Fe content is greater than many of the other iron ore deposits in Sri Lanka and comparable to the high-grade iron ore deposits found elsewhere in the world. Concentrations of common gangue constituents of Al₂O₃, SiO₂ and MgO are 7.54 wt. %, 4.40 wt. % and 2.54 wt. % respectively. Contents of S and P, which are considered as common deleterious elements are negligible. Therefore, the Buttala iron ore deposit is magnetite and hematite containing, high grade iron ore deposit with greater economic potential. An additional investigation would be advantageous in estimating the exact tonnage of the Buttala iron ore deposit.

Keywords: iron ore, Buttala, characterization, economic potential

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