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Contribution to the Magnesite Formation in the Tshipise Magnesite Field, Limpopo Province of South Africa

Lutendo D. Mutshaine¹, Baojin Zhao^{1, 2}, Thibedi Ramontja^{1, 2}, Lindani Ncube¹, Elna Van Niekerk¹
1. SACNASP, Pretoria, South Africa, 2. GSSA, JHB, South Africa, 3. GSSA, Akasia, South Africa

Three open pit mines were developed in the Tshipise Magnesite Field in the Limpopo Province, South Africa, including the Folovhodwe, Venda (Venmag) and Nyala Magnesite Mines, but the host rocks of the magnesite mineralisation and its formation mechanism proved to be contradictory with previous studies. This study aims to address and solve these opposing views. The methodologies, used, included field investigation, geochemical sampling, mineralogical and geochemical studies by means of microscopy and X-ray Diffraction (XRD), and geochemistry by X-ray Fluorescence (XRF). It was ultimately concluded that the primary magnesite host and magnesium source rock is ultramafic, rather than doleritic, as previously reported. The mineralisation mechanism occurred in four phases: (1) Starting with the intrusion of ultramafic rocks; (2) Being followed by the dolerite dykes; (3) Hydrothermal fluids enriched with CO₂; and (4) Precipitation of magnesite in ultramafic bedding planes and joints.

Keywords: Magnesite, Folovhodwe Mine, Venmag Mine, Nyala Mine, Limpopo Province