

The RF Stimulated DC & Magneto Conduction Processes In Geo-Rock Crystals Granitoids

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The gold bearing mineral from Bundelkhand region neighbouring district Lalitpur develops good dc as well as magneto-conductivity under radio frequency excitation. The granitoid crystals G-4 & G-6 well get in four probe Hall geometry to record the ohmic as well as magneto potentials under radio frequency (2-5.2 MHz) excitation and magnetic field 4, 6 KGauss has been studied and their electrical carrier concentrations 'n' with 5 MHz and magnetic field, H=14 KGauss had been computed. The MRF excitation in Geo-Rock crystals seems to impose semiconductor synthesis, since electrical carrier concentration 'n' comes out to be of the order of 10^{14} per cc.

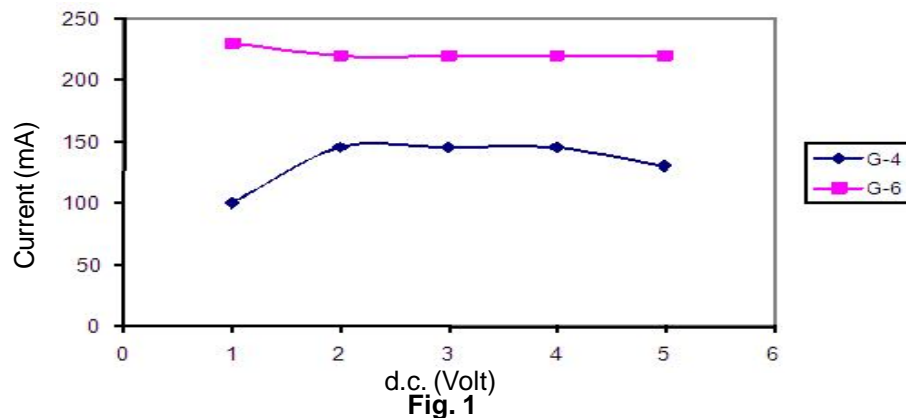
Keywords: Granitoid crystals, Four probe Hall geometry, MRF excitation.

1. INTRODUCTION

Granitoids of Bundelkhand massive belong to Archean-Palaeoproterozoic age (2500 Myrs) disclosing the crystal evolution of central India region. The concentration of Rb, Y, Nb, Ta and Th indicate avolcanic-arctectoniisetting for these rocks. The geo-chemical characteristics of granitoids essentially representing them to be of original magmatic concentration. SiO₂, Ti O₂, Al₂O₃, Fe₂O₃, MnO, MgO, CaO, Na₂O, K₂O, P₂O₅, V, Cr, Ni, Zn, Ga, Sc, Co, Cu, Rb, Sr, Ba, Pb, Y, Zr, Hf, Nb, Ta, Th, U, La, Ce, Na, Sm, Eu, Gd, Dy, Tb representing complex range of whole rock major and trace elements [1]. The study of MRF-stimulated conduction process in granitoids had been attempted for their range applicability in photo-sensors/ detectors, geo-magnetic sensors, opto-electronic components, high magnetic super conductivity and MRF stimulated Geo-imaging process [2,3].

2. EXPERIMENTAL STUDY

V-I Characterisitcs for G-4 and G-6



Geo crystals G-4 and G-6 were prepared by cutting the minerals using standard methods and employed 4-probe Hall geometry. The dc conductivity was found to be negligible at room temperature for both G-4 and G-6. However, the current flow of few hundred milli amperes was observed at different frequencies. The V-I characteristics behaviour for both the G-4 and G-6 at $f = 5$ MHz and magnetic field $H = 14000$ Gauss have been shown in Fig. 1.

The variation in concentration of charge carriers (n) with applied voltage is shown in Fig. 2 for both the G-4 and G-6.

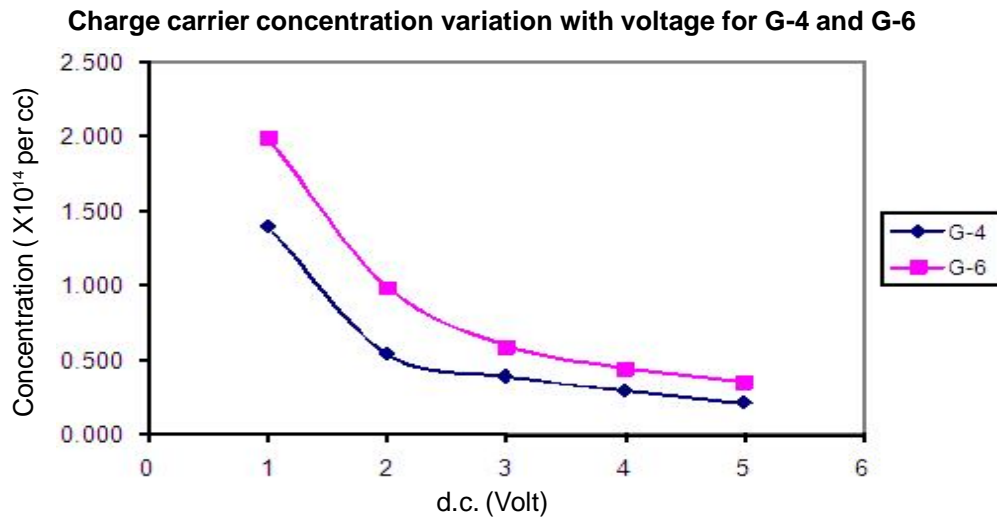


Fig. 2

The frequency dependent magnetopotential records have been shown in Fig. 3 for G-4.

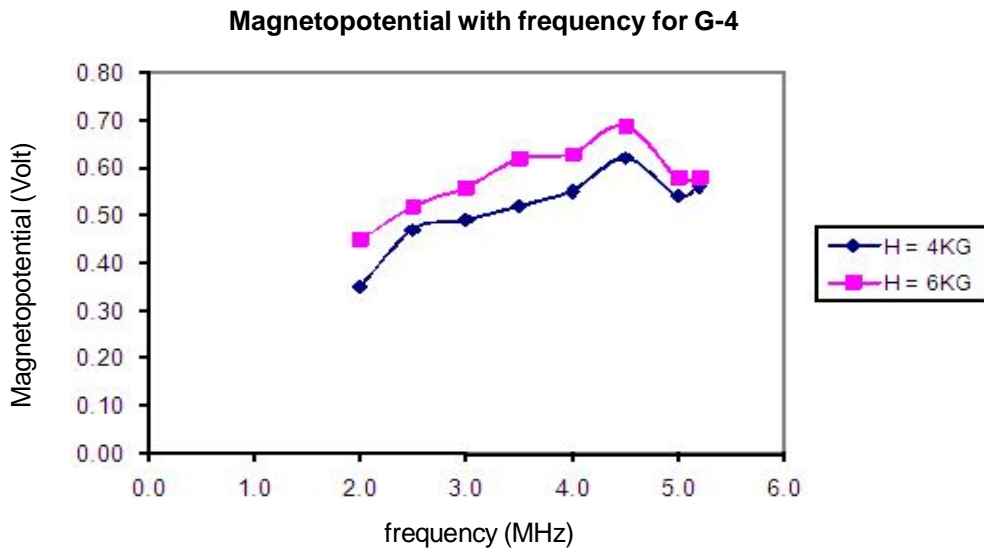
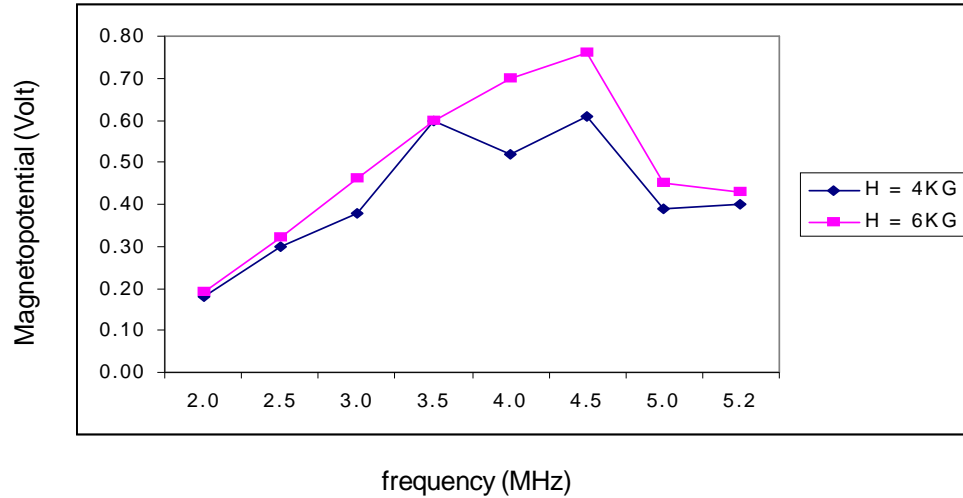


Fig. 3

The frequency dependent magnetopotential records have been shown in Fig. 4 for G-6.

Magnetopotential with frequency for G-6**Fig. 4****3. RESULTS, DISCUSSION & CONCLUSION**

Non linear current voltage (I-V) characteristics of Geo-rock crystals under MRF excitation reveals the opto-electronic sensitivity of G-4 and G-6 in the present study. The current saturation trends show the excess carrier recombination processes, explained by Auger recombination theory.

The longitudinal arrangement does not all to measure separately the potentials of electrical polarity of carrier participating in the conduction process. Hence the Hall transverse probing becomes indispensable. The MRF excitation of electricity elevation may further achieve synthetic metal characters in Geo-rocks. The magneto conduction anisotropic variation both temporally as well as spatially clearly depicts the cut ways for Geo-mappings.

4. REFERENCES

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