Assessment Report of Petrography

JCK BLUE METAL

S.F.No. 257/3A, 257/3B, 257/4A1, 257/4A2, 257/4A3, 257/4A4, 257/4B1, 257/4B2, 257/4B3, 257/4B4, 257/4B5, 257/4B6, 257/4C, 258/4A, 258/5A, 258/5B, Chithathoor Village, Cheyyar Taluk, Tiruvannamalai District.



Report Prepared by

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Certificate	Date of Sample Received	Date of Report Submission	Code No.	No. of Pages
Petrography	23/05/2025	13/06/2025	G 0321	4

PETROGRAPHY AND THIN SECTION STUDIES

As desired, the sample of **Petrography** was subjected to the following tests as per IS 2386 (Part- VIII):1963with the results noted below:

Introduction: Charnockitic is a descriptive term which may be used for rocks with igneous, Meta sedimentary or unknown protoliths that display charnockitic characteristics. It is particularly applicable for dark, homogeneous granulite facies rocks of unknown protolith which may be given names such as charnockitic gneiss or charnockiticgranofels. Charnockites are very high-grade metamorphic rocks. They straddle the boundary between igneous & metamorphic. Many charnockites have been given metamorphic and igneous names.

Hand specimen Description: This rock composed with mafic (Biotite and Hornblende) and felsic (Quartz) minerals. These grains are coarse to medium. This rock containing more 60% of dark colored minerals (mafic minerals). It is referred to as a melanocratic rock. 1

Thin section description: Biotite exhibits with pale brown, perfect cleavage, pale brown to brownish yellow pleochroism, low relief. In CPL, biotite shows second order brown interference color. Hornblende shows pale green in color, perfect two sets of cleavage, pale green to pale brown in pleochroism, high relief, third order green interference color. Biotite and Hornblende easily confused in thin section property, it can differ from extinction angle. Biotite shows parallel extinction (90^0), Hornblende shows symmetrical extinction (120^0). Quartz appear with colorless, absence of cleavage, non-pleochroism, and low relief. Quartz shows third order grey interference color in CPL. Sillimanite shows colorless, tabular and prismatic cleavage and crystal form, absence of pleochroism, high relief. In CPL, sillimanite shows normal zoning due to rapid cooling and crystallization. Many

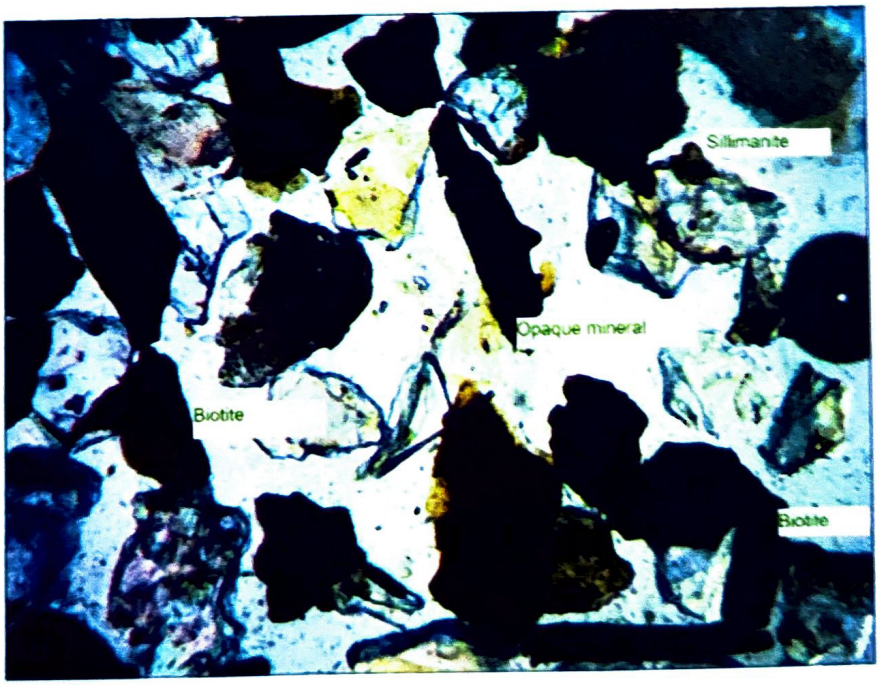
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opaque minerals are metal oxides, such as hematite (Fe_2O_3) and ilmenite ($FeTiO_3$), or sulfides, such as pyrite (FeS_2). Opaque minerals transmit no light even in 30 μm thin sections. They appear black when viewed in both plane-polarized light and between crossed polar (in any orientation).

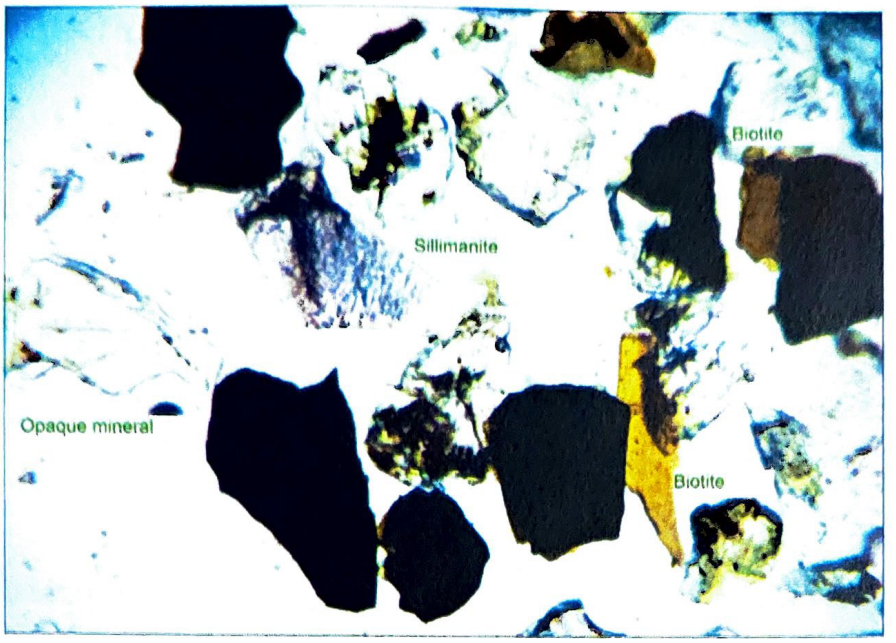
Major and Minor Minerals: In this thin section the rock composed Biotite, Hornblende, Quartz, Sillimanite and Opaque minerals. In some places iron oxide minerals such as hematite, magnetite, and pyrite are coated with Biotite and other minerals. Iron ore minerals does not transmitted light, and they coated with other minerals and hide that minerals in thin section. Hornblende and biotite are late stage minerals which replaced earlierferromagnesian silicates and crystallized as interstitial phases.The mineral constituents of the rock mass shall be about Biotite (2%), Hornblende (25%), Sillimanite (16%), Quartz (13%), Stained quartz is around 6-7% and others are Opaque minerals.

Open Nichol (Polarizer)

Name of the Minerals: **Quartz, Biotite, Sillimanite, Opaque mineral and Hornblende.**

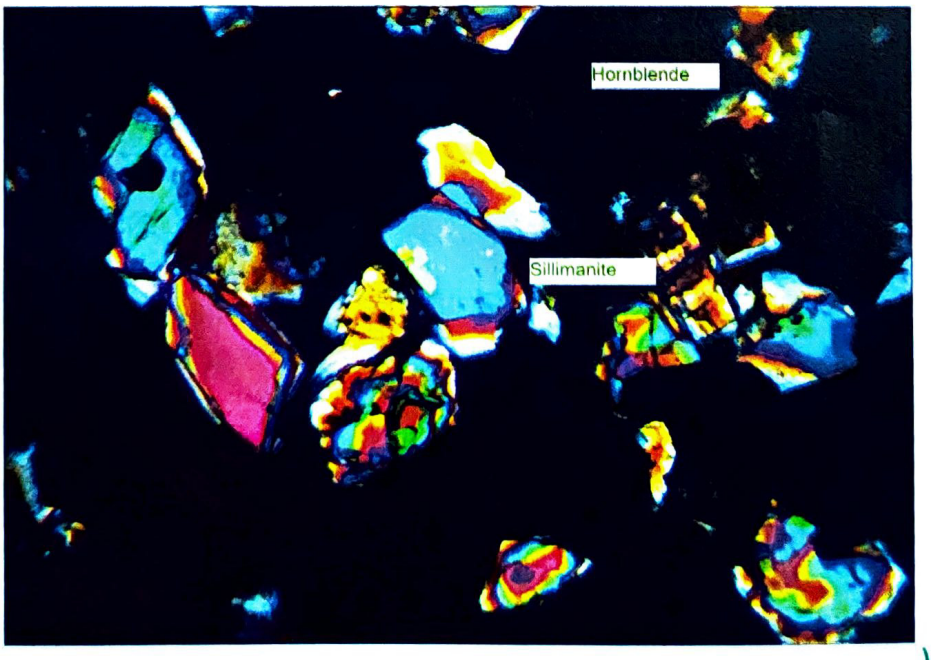


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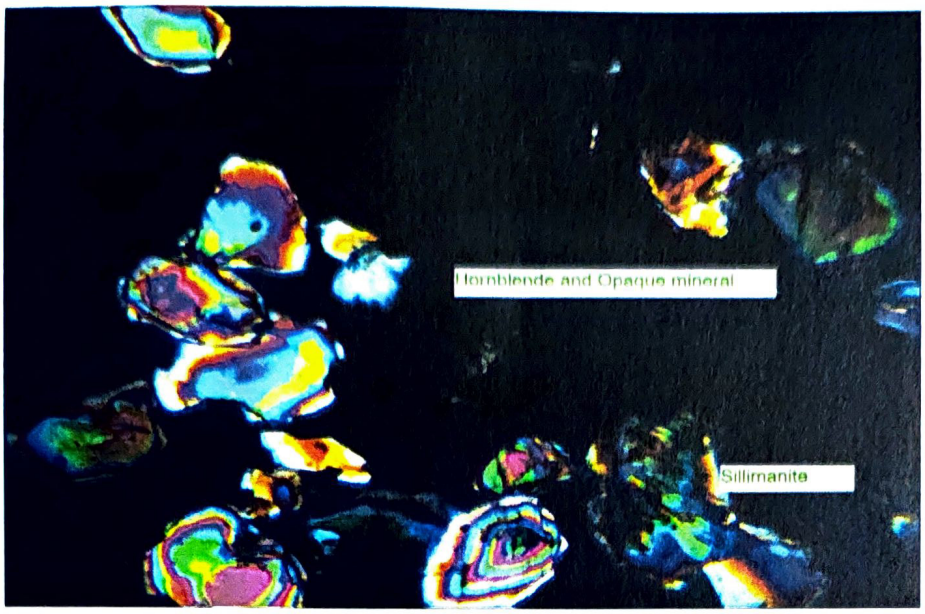


Closed Nichol (Analyzer)

Name of the Minerals: **Quartz, Biotite, Sillimanite, Hypersthene, Opaque mineral and Hornblende**



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Mode of Occurrence: Charnockite is the principal rock type of high grade or granulite facies terrains. Charnockite occurs all over the world, most often in deeply eroded Precambrian basement rock complexes. Dark color and clouding of the feldspars are typical features of these rocks, as is a bluish tint in quartz. Some charnockites contain a brownish-green hornblende, often rather rich in titanium. The garnet characteristic of these rocks is rich in pyrope. It refers both to a series of igneous rocks and a mineral assemblage that is similar to a metamorphic facies. Charnockites are characteristic of granulite terranes, just as the highest-grade portions of amphibolite facies are often associated with biotite or hornblende granites.Equivalents of gabbro, monzonite, tonalite, monzodiorite, monzogranite, granodiorite and granite.The charnockite series originally was assumed to have developed by the fractional crystallization of a silicate magma. ***This rock dominantly present with Biotite and Hornblende, it is referred to as a Biotite- Hornblende Charnockite.***

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