Sphene bearing gneisses of Madhugiri area, Karnataka State, India

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ABSTRACT

Sphene fleck granitic rocks (Titanitflecken-gesteine) composed of biotite and migmatitic gneisses are frequently found in the granitic terrain between Madhugiri and Koratagere. The detailed field and thin section studies of these rocks indicate that sphene is formed during the migmatization and feldspathization of the amphibolites, which has resulted in the recrystallization of plagioclase and in the breakdown of hornblende and biotite. The released lime, titania and iron have resulted in the formation of sphene, seen in the gneissic rocks as trains, patches and discrete crystals. Mineralogical, petrological and petrochemical evidences are given in support of the above conclusion.

1. INTRODUCTION

Sphene fleck biotite gneisses and hornblende rich migmatitic gneisses occur extensively in the quarries situated 1 km east of Thumbadi, 1.5 km NW of Bukkapatna, 1 km east of Fakeerappanapalya and 2 km NE of Rangana-halli and they are shown on the sketch map of the area (text-figure 1).

In the quarries situated near Thumbadi and Bukkapatna, coarse porphyritic gneiss with imperfect gneissosity but with lenses of amphibolites and segregations of mafic minerals showing imperceptible gradation with the host rock is seen containing sphene as trains, patches and big and small discrete crystals exhibiting rude lineation. In other quarries migmatitic gneiss rich in basic patches occurs containing numerous flecks, segregation and discrete crystals of sphene.

The occurrence of sphene in the granitic rocks has been reported by many investigators like Webb, Milton and Marchenko.
PETROGRAPHY OF THE HOST ROCKS

From a study of thin sections cut from biotite gneisses, it is observed that the sphene is always associated with the ferromagnesian minerals like biotite and hornblende together with magnetite and epidote. In the migmatitic