

AN OCCURRENCE OF SPODUMENE IN THE SANDUR SCHIST BELT, KARNATAKA

ABDUL MATIN¹, KAMAL NANDI² AND DHRUBA MUKHOPADHYAY³

¹ Department of Geology, Ashutosh College, Calcutta 700 026

² Department of Geology, Presidency College, Calcutta 700 073

³ Department of Applied Geology, Indian School of Mines, Dhanbad 826 004

Abstract

Spodumene is recorded from the northern part of the Sandur Schist Belt, near T. B. Dam, Hospet. The mineral occurs in a quartz-spodumene vein near the contact of the supracrustal rocks with the granitic gneisses.

Introduction

Spodumene is reported occurring as a small quartz-spodumene vein within the banded cherty horizon at the western fringe of the Sandur schist belt (Foote, 1895, Roy and Biswas, 1983) near Hospet (Fig. 1). The vein, made up of quartz and

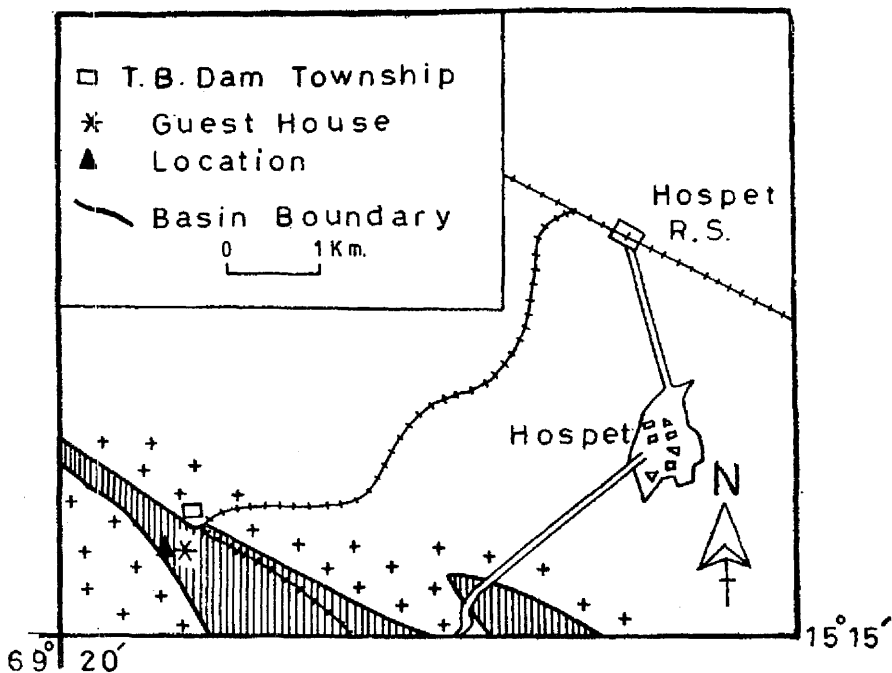


Figure 1. Map showing the location of spodumene-bearing vein. Vertically ruled area - Schist belt, crosses - Granite.

spodumene, crops out in a small area and is partly covered by talus. The mineral grains are coarse in size, ranging from less than a cm to a few cm in dimension. The Peninsular gneiss on the western side of the Sandur basin is exposed in close vicinity of the spodumene-bearing body.

Physical, Optical, and X-Ray Studies

Spodumene occurs as coarse tabular crystals showing semi-translucent milky white colour and pearly lustre on cleavage surface. Two sets of cleavage and a prominent parting are present.

Under the microscope it is pale greenish-white in colour. Fine-grained veinlets of quartz occur parallel to the cleavage trace; smaller inclusions of disseminated opaque minerals are present. Irregular fractures and kink bands are observed. Kink bands are at high angles to the cleavage trace and are developed due to deformation subsequent to crystallization. $2V$ measured on universal stage is,

$$(+) 2V_z = 70^\circ \pm 2^\circ$$

X-ray powder pattern of the mineral was obtained using Philips PW 1010 unit at 40 kv, 20 mA current and with Cu-K α radiation of wavelength 1.5418 Å and Ni filter. The data from the X-ray diffractogram are presented in Table I. From X-ray

TABLE I. X-ray data for spodumene form
T. B. Dam; Hospet.

d (Å)	I/I ₁	hkl	d (Å)	I/I ₁	hkl
6.09	40	110	2.14	10	311
4.40	30	$\bar{1}11$	2.10	20	022
4.20	70	020	2.05	30	$\bar{3}31$
3.44	30	111	2.03	20	330
3.19	30	021	1.925	20	
3.04	10	220	1.862	40	
2.93	100	$\bar{2}21$	1.827	5	
2.87	10	$\bar{3}11$	1.784	5	
2.79	90	310	1.737	20	
2.67	20	130	1.718	5	
2.55	10	$\bar{2}02$	1.683	5	
2.45	40	002	1.650	10	
2.35	30	221	1.603	30	
2.22	10	400	1.593	10	
2.17	5	$\bar{2}22$	1.568	50	

data, the mineral is identified as α -spodumene (LiAlSi₂O₆). The cell dimension is estimated as,

$$\begin{aligned} a &= 9.50 \text{ \AA} \\ b &= 8.55 \text{ \AA} \\ c &= 5.24 \text{ \AA} \\ \beta &= 110^\circ 30' \end{aligned}$$

Spodumene is a characteristic mineral in lithium-bearing granitic pegmatites and is one of the principal sources of lithium (Deer *et al.* 1982). Such pegmatite bodies occur in exocontact metamorphism typically within 1–3 km from the nearby granite contact (Laznicka, 1985). The absence of petalite in the quartz-spodumene

vein of this area indicates that the crystallization of the liquid began at or below 600°C and was completed in an essentially closed system (Deer *et al.* 1982).

More intensive search along the western margin of the Sandur basin may lead to the discovery of fresh occurrences of this lithium-bearing mineral.

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