Petrology of blueschist from the Western Himalaya (Ladakh, NW India): Exploring the complex behavior of a lawsonite-bearing system in a paleo-accretionary setting

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A R T I C L E   I N F O

Article history:
Received 14 December 2015
Accepted 15 February 2016
Available online 27 February 2016

Keywords:
Lawsonite blueschist
cold subduction processes
paleo-accretionary prism
thermodynamic modeling
P-T evolution
Western Himalaya

A B S T R A C T

Although the Himalaya is the archetype of collisional orogens, formed as a consequence of the closure of the Neo-Tethyan ocean separating India from Asia, high-pressure metamorphic rocks are rare. Beside few eclogites, corresponding to the metamorphosed continental Indian crust dragged below Asia or underthrust beneath southern Tibet, blueschists occur seldom along the Yarlung–Tsangpo Suture zone, i.e. the suture marking the India–Asia collision. These blueschists, mostly interpreted as related to paleo-accretionary prisms formed in response to the subduction of the Neo-Tethyan ocean below the Asian plate, are crucial for constraining the evolution of the India–Asia convergence zone during the closure of the Neo-Tethyan Ocean.

In the Western Himalaya, the best occurrence of blueschist is that of the Sapi–Shergol Ophiolitic Mélangé in Ladakh. This unit is dominated by volcanoclastic sequences rich in ma

1. Introduction

Lawsonite-bearing blueschists and eclogites are witnesses of cold subduction processes occurred along ancient convergent margins. Metamorphic processes involved in the generation and preservation of lawsonite are crucial in many research areas, ranging from petrology to geochemistry, geodynamics, and geophysics (e.g. Hacker et al., 2003; Bebout, 2007; Hacker, 2008; Davis, 2011; Martin et al., 2011; Vitale Brovarone et al., 2011; Chantel et al., 2012; Abers et al., 2013; Cao et al., 2013; Kim et al., 2013; Spandler and Pirard, 2013). Therefore, lawsonite-bearing eclogites and, to a lesser extent, lawsonite-bearing blueschists have been the focus of several studies, especially in recent years (Tsujimori and Ernst, 2014 and references therein). Compared to