Document details - Investigation of A-X band system of astrophysically significant molecule BS

Journal of Physical Science

Volume 29, Issue 1, 2018, Pages 133-140

Investigation of A-X band system of astrophysically significant molecule BS(Article)(Open Access)

Balasubramanian, K., Ganesan, S., Narayanan, R.

[a]Department of Physics, Mepco Schlenk Engineering College, Sivakasi, 626005, India
[b]Department of Physics, V.V.Vanniaperumal College for Women, Virudhunagar, 626001, India
[c]Physics Research Centre, VHNSN College, Virudhunagar, 626001, India

Abstract

It is widely known that molecular signatures in celestial object play a vital role in deriving the physical conditions of the object using spectroscopic technique. The present study therefore focuses on the evaluation of Franck-Condon factors (FCFs) and r-centroids for the A-X band system of Boron mono-sulphide (BS) molecule by a numerical integration method using the suitable potential. With the help of FCFs and r-centroids, the vibrational temperature of the source is estimated and is found to be about 6893 K. The vibrational temperature estimated in the present study reveals that the rotational temperature of the molecule has to be considered for the identification of the chosen band system in the astrophysical spectra. The vibration rotation interaction (VRI) effect for the chosen band system is discussed. It is found that the VRI effect may influence the effective temperature of the source and hence the effect of VRI has to be considered at the time of identifying the BS molecular lines in the spectra of sunspot or any celestial object. © Penerbit Universiti Sains Malaysia, 2018.

Author keywords

BS molecule | Franck-Condon factors | R-centroids | Sunspot | Vibrational temperature

Indexed keywords

Engineering controlled terms: Band structure | Numerical methods | Sulfur compounds

Engineering uncontrolled terms: Franck-Condon factors | Numerical integration methods | R-centroids | Rotational temperature | Spectroscopic technique | Sunspot | Vibration-rotation interactions | Vibrational temperature

Engineering main heading: Molecules

ISSN: 16753402
Source Type: Journal
Original language: English
DOI: 10.21315/jps2018.29.1.9
Document Type: Article
Publisher: Penerbit Universiti Sains Malaysia

Balasubramanian, K.; Department of Physics, Mepco Schlenk Engineering College, Sivakasi, India;

Prominence percentile:

About Scopus

What is Scopus

Content coverage

Scopus blog

Scopus API

Privacy matters

Language

日本語版を表示する

查看简体中文版本

查看繁體中文版本

Просмотр версии на русском языке

Customer Service

Help

Tutorials

Contact us

ELSEVIER