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From Earth Missions to Deep Space Exploration (05)
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DEEP SPACE EXPLORATION USING INFRARED SPECTROSCOPY

Abstract

Infrared spectroscopy is not a new term and has been used in laboratory for study and identification of chemicals. This method can also be applied outside laboratories to search for life sustainable environments on unknown planets. The technique makes use of the fact that every molecular bond vibrates at a certain frequency and can absorb resonant frequencies. The analysis of the absorbance spectrum for peak values, position and shape can thus be used for determining molecular structure of an element and if this technique is used in open space on a planet, it can help in determining the chemical composition of its environment. The subject of scientific interest is the characteristics of the environment nearer to the surface. Thus a capsule is to be deployed onto the surface of the planet from where it will analyze the immediate environment surrounding it. The capsule will at no time during its mission life be mobile and thus will gather all information from one place only. It will carry all necessary instruments such as the spectrometer, as its payload, Onboard Command and data handling unit, power production unit, Thermal control unit, attitude determination and control unit and communication receivers and antenna. All the scientific data collected will then be transmitted back to earth.