59th International Astronautical Congress 2008

37th SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps (A4.)
SETI I – SETI Science and Technology (1.)

Author: Dr. Brij Tewari
University of Guyana, Georgetown, Guyana, brijtew@yahoo.com

UPDATE ON CONTROVERSIAL VIEW OF TERRESTRIAL AND EXTRATERRESTRIAL ORIGINS OF LIFE

Abstract

One of the greatest puzzles of all time is how did life arise? It has been universally presumed that life arose from carbon compounds, but from where these organic molecules come? The hypothesis for terrestrial origin of bio-organic molecules is supported by some world class scientists (Miller, Urey, Ferris, Kamaluddin etc.) . According to this hypothesis bio-organic molecules are early formed in a mixture of CH4, NH3, H2O that is, a strongly reduced atmosphere, when spark discharges and UV light are used as energy sources. The hypothesis for extraterrestrial origins of prebiotic organic molecules is supported by some others world class scientists (Oro, Horneck, Delsemme, Greenberg etc.). According to this hypothesis it was suggested that chemical evolution which has proceeded at early stage of solar system, origins would lead to appearance of a very complex organic compounds. These compounds may have been delivered to early earth at the stage of the "late heavy bombardment" and later. The next hypothesis which is midway between terrestrial and extraterrestrial hypothesis is supported by some world class scientists (Kobayashi, Yanagawa etc.) According to this hypothesis abiotic formation of organic compounds taken in the primitive atmosphere of earth as well as others planetary / cometary atmosphere in presence of effective energy sources. Present topic is still a subject of controversy and debate among scientists. Therefore further investigation in this area of research is interesting. More than half century ago, Bernal and Goldschmidt independently proposed that clay minerals may have played an important role in prebiotic synthesis. In the present work halloysite, illite and montmorillonite were characterized by elemental and spectral studies. Stabilities of these minerals were tested in various concentration of acids, bases and salt solutions at room and boiling temperature. Adsorption interaction of 2 – aminopyridine (2-AP), 3 – aminopyridine(3-AP) and 4-aminopyridine (4-AP) in the concentration range 10-3 – 10-4 M and at room temperature (30 1?C) was studied with above mentioned clay minerals. 3-AP was found to have greater affinity with all three clay minerals studied. Among the clay minerals montmorillonite and illite showed maximum and minimum adsorption with all there adsorbates. The interaction followed the Langmuir type of adsorption in general. Present studies suggest the importance of clay minerals in the stabilization of biomolecules from degradation on primitive earth. This study supports the hypothesis of terrestrial origins of life. Detail will be presented.